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INDUS VALLEY CIVILIZATION

DIALOGUE AMONG CIVILIZATIONS

YEAR
2001

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2001- THE YEAR OF
DIALOGUE AMONG CIVILIZATIONS

INDUS VALLEY CIVILIZATION
COLLECTION OF PAPERS PRESENTED IN THE INTERNATIONAL COLLOQUIUM
ON INDUS VALLEY CIVILIZATION AT ISLAMABAD (6TH - 8TH APRIL 2001)

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GOVERNMENT OF PAKISTAN, ISLAMABAD

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Address by the Federal Minister for Education

Address by the Member of Executive Board of UNESCO.

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Institutional Key to the Rapid Rise of Indus Civilization
7. Fazal Dad Kakar
In quest of Origin of the Indus Valley Civilization
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FOREWARD

UNESCO being a component Organization of the United Nations has been striving to achieve the objectives assigned to it through development and projection of culture and education by creating interaction among Member Nations. The main goal of United Nations is to maintain peace and tranquility in the world and to achieve the goal of peace among civilizations. The main focus had been on resolving issues among the Member Nations by means other than armed conflicts.

Keeping in view the growing problems of civilizations and situations of conflict the United Nations had declared the year 2001 as Year of Dialogue among Civilizations. Development of civilizations involves interaction of centuries among the contemporary civilizations through emigration, trades and other links. This interaction took impetus with the invention of the wheel. In this process the face of the earth has witnessed the rise and fall of many dynasties and civilizations.

The Indus Valley Civilization depicted in Moenjodaro and Harrapa being as old as 5000 B.C is still continuative. Although a lot of information has been gathered yet the translation of the inscriptions of this civilization is a challenge to scholars. The present civilization in the region i.e. Pakistan is in a large measure a continuum of the Indus Valley Civilization. Besides effects of the Indus Valley Civilization on the present day it had affected through interaction the contemporary civilizations of Nile, Euphrates and China.

On my behalf and on behalf of the Government of Pakistan I thank UNESCO for helping in organizing the first ever activity in connection with the United Nations declaration of Year 2001 as Year of Dialogue Among Civilizations and making possible the holding of an International Colloquium on Indus Valley Civilization from 6th to 8th April, 2001. Thanks are also due to the scholars, who participated in the Colloquium after travelling long distances from Paris, Tokyo, Delhi and from within the country. The participating Scholars presented their valuable research in the form of papers, discussion and finally the Resolutions. All this will serve as guidelines for preparing a future strategy and plan of action for dialogue among civilizations and as such promote the efforts of scholars of civilization. "My special thanks" are due to the Director General UNESCO, Mr. Koichiro Matsuura, who considering the international importance of the event and came over to Pakistan and has given his Key Note Address which would serve as a guideline for the deliberations.

Samin Jan Babar
Secretary,
Ministry of Minorities, Culture, Sports,
Tourism and Youth Affairs

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PREFACE

It is a visible and admitted fact that the development and growth of our common cultural heritage has been a result of mutual relationship and interaction among different cultures and civilizations.

Realizing the necessity of harmonizing and to strengthen these mutual bonds and to further promote an atmosphere of trust and confidence among diverse traditions and thoughts, the United Nations timely declared the year 2001 as the Year of "Dialogue Among Civilizations" and in order to achieve better and significant results, the sacred task of holding and boosting up dialogue among civilizations was assigned to the UNESCO.

Pakistan, being the custodian of one of the oldest civilization of the world - the Indus Valley Civilization, was made the torchbearer by UNESCO to initiate the dialogue on Indus Civilization. In response to this, the Government Pakistan invited archaeologists, historians and architects both from home and abroad for their participation in the Dialogue on Indus Civilization, held at Islamabad from 6th to 8th April 2001. Mr. Koichiro Matsuura, Director General, UNESCO inaugurated the colloquium. Majority of scholars presented the results of their researches and shared their understanding and experience with fellow researchers through discussions that followed each presentation. Different facets of the Indus Civilization like new discoveries, origin, urbanization, decline, dating, materials, technology, language and mythology were focal points of discussion in the colloquium. Thus, this book is based on the results of new fieldwork and synthesis of fresh data presented by scholars during the colloquium.

A generous grant from UNESCO made it possible for scholars and researchers to travel to Islamabad and to attend the colloquium. UNESCO also provided funds for the publication of this book.

At the end, we would like to express our thanks to the delegates to the colloquium for their contributions and participation in the deliberation and discussions and thus enhancing and updating our understanding and knowledge of Indus Civilization.

M.A.Halim
Editor

MESSAGE BY

**GENERAL PERVEZ MUSHARAF
THE CHIEF EXECUTIVE
ISLAMIC REPUBLIC OF PAKISTAN**



I wish to convey my sincere congratulations to the organizers of the International Colloquium on Indus Valley Civilization for bringing together a galaxy of national and international scholars and archaeologists to deliberate on the various aspects of Indus Valley Civilization - one of the great civilizations of antiquity that developed on the soil of Pakistan and flourished for several millennia before it faded away, leaving behind its remnants for archaeologists to learn from their achievement. We feel specially privileged that His Excellency Koichiro Matsuura is participating in the Colloquium underscoring the importance of the occasion and the commitment of UNESCO in helping Pakistan's efforts to preserve the archaeological sites and to promote international understanding of this great ancient civilization.

We are highly indebted to the efforts and researches of scholars and archaeologists, spreading over most part the last century, to bring to light the various aspects of the Indus Valley Civilization. They have succeeded in revealing many unknowns and hidden aspects of this great civilization, but many aspects remain surrounded in mystery. A great challenge lies in deciphering the ancient script found on the seals. We hope that one-day we will be able to understand the secret of this writing and learn more about the Indus Valley Civilization, its origins, its achievements and its decline.

The Indus Valley Civilization is one of the four known great ancient civilizations that flourished in Mesopotamia, Egypt, China and Pakistan. In the Indus Valley, which is modern Pakistan an urban culture had already appeared in the third millennium BC as is evident from the ruined cities Moenjodaro and Harappa. We know through archaeological discoveries that the people of the Indus Valley Civilization had made links with other contemporary nation of the world through land, river and sea routes. Trade brought prosperity to their ancient cities. The achievements of the people of the Indus Valley Civilization, especially the organized and sophisticated society they had developed thousand of years ago, are not only a proud heritage of Pakistan but of the entire world.

Pakistan has been fortunate to have a rich history and culture. It is the cradle of not only the Indus Valley Civilization, but also the Gandhara civilization that flourished more than two thousand years ago is the center of Buddhist learning. Through out the ages, Pakistan has been the meeting point of old empires and diverse cultures and traditions. With the advent of Islam in Sindh in the Eight century and later in the remaining parts of the country, Pakistan has seen the blossoming of rich Islamic traditions, which are evident in the beauty of our mosques and mausoleums as well as our music and literature. We greatly value and cherish this rich heritage spanning more than five millennia. Within our limited resources we are doing all we can to preserve our archaeological sites and old buildings. However, the task requires skill, technology and large resources. We hope that UNESCO will continue to extend and expand its assistance in support of our efforts.

An important aspect of International Colloquium on Indus Valley Civilization is that it is being organized at a time when the United Nations has declared year 2001 as the "Year of Dialogue among Civilization." This reminds us of the essential requirement of dialogue recognized through out human history for resolution of disputes and promotion of peace. We have always believed in dialogue and respect for the principles of the Charter of the United Nations for resolving disputes, avoiding conflicts and building peace and prosperity for the entire humanity. I invite the scholars attending the colloquium to highlight the significance of the "Year of Dialogue - Among Civilization". And the importance of dialogue for lasting peace as seen through the eyes of history. I wish the Colloquium every success.

ADDRESS BY

**MR.S.K.TRESSLER, MINISTER FOR MINORITIES,
CULTURE, SPORTS, TOURISM AND YOUTH AFFAIRS
GOVERNMENT OF PAKISTAN**



His Excellency Mr. Koichiro Matsuura, Director General UNESCO, Excellencies, Scholars, Ladies and Gentlemen.

It gives me great honour and pleasure to express to you thanks on behalf of the Government of Pakistan and on my own behalf for the trouble that you have so kindly taken and for the time that you have spared to grace this occasion on the inauguration ceremony of the International Colloquium on Indus Valley Civilization.

The Government of Pakistan and Ministry of Culture in particular, is grateful to the Director General UNESCO for contributing his time and commitment to make this Colloquium a success. The United Nations has very timely declared year 2001 as the year of Dialogue among Civilizations. Dialogue is the natural course for diffusing even the most complex situations. It is perhaps the best medium to logically and rationally resolve the differences between people and nations.

Pakistan has been a cradle to many major religions of the world. It was here that Buddhism flourished and ultimately shifted eastwards, leaving behinds thousands of relics, which are still highly revered by the Buddhists throughout the world. Similarly, we have a good number of important relics of Hindu, Sikh and Zoroastrian beliefs. As such there is a tremendous potential of promoting religious tourism in Pakistan. The contribution of UNESCO for the preservation of our important heritage is highly commendable. Their consistent support for the preservation of urban Center of Moenjodaro of the Indus Valley Civilization and also for the Gandhara relics is a source of inspiration and satisfaction. I would like to request UNESCO to expand its activities in order to cover the expanded heritage representing two million years of unrecorded and recorded history of this great country. We look forward for active cooperation from UNESCO in this regard.

I am so thankful to the Excellencies and Scholars for the great interest and particularly for the trouble you have taken to come here for the Inaugural Ceremony and for participation in the International Colloquium on Indus Valley Civilization. Your presence here is a

source of encouragement for us. I thank UNESCO and other friendly countries who sponsored this Colloquium and once again thank his Excellency Mr. Koichiro Matsuura, Director General UNESCO for personally attending this important Colloquium and showing his deep commitment for preservation of World Heritage.

INAUGURAL ADDRESS BY

**MR. KOICHIRO MATSUURA, DIRECTOR GENERAL OF THE
UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND
CULTURAL ORGANIZATION (UNESCO)**



Mr. Chairman, Distinguished Ministers, Ladies and Gentlemen,
I very much welcome this opportunity to be with you today for the opening of this International Colloquium on the Indus Valley Civilization. The authorities of Pakistan are to be commended for taking this initiative.

It is particularly opportune that this meeting should be held at this time. This United Nations Year for Dialogue among Civilizations, of which your meeting is one of the flagship events, is one to which UNESCO, among the organizations of the United Nations system, is fully committed. This was, I believe, strongly demonstrated when I launched the Year, in New York, along with UN Secretary General Kofi Annan and the Co-initiator, President Khatami of Iran, with a Round Table of Head of State and Government who's debates underlined the overwhelming importance attached by the international community to the improvement of our reciprocal knowledge of, and appreciation for, each other's cultures as a way of consolidating the foundations of world peace.

Before such eminent specialists gathered here, whose intellectual and academic qualifications far surpass my own, I feel it appropriate to dwell, for my part, on the significance of your theme for the overall debate, taking place concerning dialogue among civilizations.

Ladies and Gentlemen:

The discovery in the early 1920s of a great urban civilization on the banks of the Indus was a cultural sensation that had far-reaching implications. The number, size and modernity of the cities in the Indus Valley astonished the intellectual community and raised numerous questions, some of which have not yet been resolved. Moenjodaro, Harappa, Kot Diji, and Mehrgarh: the names of these cities and sites now echo in the collective imagination and in the mines of intellectuals alike as "benchmarks of civilization".

Here was indeed a major discovery, that of a civilization that was to prove to be one of the World's greatest and oldest. It certainly had a major influence in Asia. It is understandably, then, a crucial part of our understanding of the world history of humankind.

Right from the start, the discovery of the Indus civilization, therefore, raised two major issues that lie at the heart of all thinking on the dialogue of civilizations. Was it a continuation of other civilization, in particular those of Mesopotamia? Or did it draw its underlying force from its birth out of a local culture?

The Pakistani archaeologist Rafique Mughal was the first to observe that the birth of the earliest major urban civilization in South Asia, therefore, took place most certainly on the soil of the Indus independently of any direct influence from other regions. After much research, including the excavations at Mehrgarh by Mr. Jean-Francois Jarrige, whose presence here I warmly welcome, the Indus Valley archaeological epic, probably one of the finest in the history of archaeology has confirmed the accuracy of Rafique Mughal's work.

Geography, history, and culture-everything shows that something happened here that is of great importance for our understanding of the mechanisms, processes and interactions of the dialogue among cultures and civilizations. If we can pierce the mystery of the language, writing and original settlers of the Indus, we might even perhaps eventually re-think our entire conception of Eurasian civilization.

I find it interesting, in this context, to note that the Indus civilization was both the setting and the expression for two major interactions. First of all, the peoples of the Indus valley interacted with their natural environment. The big issue facing those peoples from time immemorial has always been to confront and resolve the problems raised by the Indus river system, one of the mightiest in the world, to cope with its annual flow and erosive power and also its capacity to fertilize the soil and permit the germination and growth of crops.

It is through the responses found to these challenges that life developed, that forms of cultural expression evolved, that gods, rituals and myths were conceived, that social structures took conform and meaning and that political power became established.

On that basis, cultural and human interactions, the other major advance in the dialogue of civilizations, took place in the Indus region. Initially, nomadic and sedentary lifestyles depended on the rhythms and shifting course of the river and on the complementarity of highlands and plains. It was also in this evolving context that the Indus became such a decisive source of dialogue, as a great corridor for communication and commercial, cultural and human exchanges between the Near East, Central Asia and the Indo-Gangetic region.

Coins, tablets and seals from the Indus have been discovered in Mesopotamia, making it possible to map out the routes followed by people, ideas and goods. The Indus civilization is therefore, an excellent expression of the dialectic of dialogue, with its two-way movement, its points of contact and cross- fertilization that UNESCO is seeking to promote.

I believe that is important for our understanding of each other. No civilization is "pure." We are all rooted in cultures and civilizations that have fed and enriched themselves through this cross-fertilization. If one of the successes of this UN Year were to be greater recognition of this fact, I would be happy. What a factor in reduction of tension that would be, as people realized that centuries old 'enemies' had a shared past and a common will to shape the future.

This is why UNESCO's fight to achieve education for all is so intrinsically bound up with its fight to preserve the cultural heritage, itself in dissociable from the dialogue among civilization so rightly given prominence by your colloquium and commemorated throughout the world during this United Nations Year.

I wish you every success for your deliberations.

WELCOME ADDRESS BY

**MR. SAMIN JAN BABAR, THE SECRETARY,
MINISTRY OF MINORITIES CULTURE,
SPORTS TOURISM AND YOUTH AFFAIRS,
GOVERNMENT OF PAKISTAN**



Your Excellency, Mr. Koichiro Matsuura, Director General, UNESCO Federal Ministers, Excellencies, Distinguished Scholars, Ladies and Gentlemen! I feel greatly honoured in welcoming you Sir, at the inauguration of the International Colloquium on Indus Valley Civilization. Your presence on this occasion reflects your personal interest in the promotion of our glorious cultural heritage. I also very warmly welcome the eminent scholars who have traveled great distances, from abroad and from within the country, to take part in the serious and scholarly deliberations during the three-day international colloquium on different aspects of the Indus Valley Civilization.

This international colloquium dovetails perfectly with the call of the United Nations to declare 2001 as the Year of Dialogue among Civilizations. Pakistan has always stood firm on its commitments to the world bodies by fulfilling its national and international obligations. Pakistan is one of the most culturally rich countries of the region. This land saw the birth of a glorious and advanced civilization the "Indus Valley Civilization". This Civilization is a legacy of the glorious past that has attracted eminent scholars of history and anthropology and the humble commoners like me, to study and learn from the human experience.

I hope that the wide-ranging deliberations and serious discussions during the three days will cover various aspects of the Indus Valley Civilization right from its inception in the Neolithic Age at Mehrgarh in Baluchistan, down to the present day human situation. The participating scholars bring with them diverse background of knowledge and specialization and the scholarly discourses of the colloquium will be interesting and highly informative to make our understanding of the people of the past more meaningful. The participation of the international scholars has further added to the importance and scholarly significance of this conference. The intellectual interaction between the scholars, local and foreign, during the three-day colloquium will enhance their understanding of the complexities of this ancient civilization. I am confident that this international colloquium will prove a great success in promoting dialogue among nations.

I take this opportunity to thank UNESCO and particularly the Director General for their consistent support for making this colloquium possible. The presence of the Director General at this colloquium signifies the importance that he attaches to this event.

Personally, and on behalf of the Government of Pakistan, I thank His Excellency the Director General for taking time from his preoccupations and made this special trip to Pakistan in order to express his continuing support to the cause of preserving the cultural heritage of Pakistan. I would also like to express the gratitude of all our scholars to the Director General for providing a most needed financial support for the colloquium. The Officers of the Ministry of Culture and those of the Federal Department of Archaeology have given their very best efforts so that this colloquium could be successfully held. For their efforts they deserve my special appreciation and thanks. I also thank the national and foreign scholars for their keen interest in the colloquium and for their active participation.

I am fully convinced that the scholars from Pakistan will sit down with their colleagues from abroad and help the world to know more about the great Indus Valley Civilization, its people and their great heritage that they have bequeathed to posterity.

ADDRESS BY

**MS. ZUBIDA JALAL,
FEDERAL MINISTER FOR EDUCATION
GOVERNMENT OF PAKISTAN**



It is my great pleasure to be here at the Colloquium, amidst eminent scholars and experts. This is a rare opportunity for us to celebrate a great heritage, which is in constant state of renewal, always waiting to be rediscovered as the treasure within, I mean, the Indus and the Indus Valley Civilization.

Sitting and working for girls education in Mand, a remote and extremely under developed corner of Pakistan, lying in Makran district, often made me wonder at the irony of history and the rise and fall of societies. Today Baluchistan is seen as the most under-developed region, yet, it was Baluchistan, which was the cradle for the Indus Civilization. The Indus civilization arose out of the culture of the Baluchistan plateau from 4000 BC to 2000 BC. The Colloquium is a reminder to us of the layering of history out of which people are born, out of which people develop, connect, disconnect and re-connect. I suppose this is the magic of conscious human evolution, a fascinating process, which makes us all continue discovering purposefully, respecting milestones of history, where we have come from and focused on where we want to go.

Indus is not merely a great river stretching from Tibet to the Arabian Sea but its spirit has evolved and absorbed multiple cultures through its people, some of whom, still live in the Manchar lake in Sindh, called the Mohannas. About 100 miles north of Manchar lies Moenjodaro dating from the fourth Millenium B.C. emerging as a group of settlements often called the 'heart of the Indus civilization.' We in Pakistan are proud to be the inheritors of a globalized civilization dating as far back as the fourth Millennium BC when Moenjodaro as modern site boasted of lines of communication between Sindh, Baluchistan, Mesopotamia, Afghanistan and Turkmenia for trade and raw materials. It is widely recognized that the Indus valley culture was an unprecedented phenomenon. The Indus civilization is not only recognized as the oldest civilization for the ancient Orient but also as being more extensive than those of the Nile, and Karun Valley covering almost 500,000 square miles. Our challenge is to square devise mechanisms of learning which can inculcate the 'spirit and soul' of the Indus, to absorb diversity and all its positive elements, to give us depth and a working wisdom for our continuous positive evolution. Our challenge is also not to become passive victims of cyclical nature of civilizations; rather we ought to engage with people of different

civilizations in a meaningful discourse. Only such an interaction can be the basis for participating in 2001 as the 'Year of Dialogue among Civilization' proclaimed by the United Nations General Assembly.

In these times of drought we have once again learnt to understand the value of water as a life source, not taking for granted as ever replenishing. Indus is knocking at our doorsteps compelling us to look at it as nature's living heirloom, a rich source of history, past present and the future, combining the essence of the life connected to people, nature and their inextricable relationship. Indus never took anything for granted but remained loyal to the logic of nature, we too need to remind ourselves of that logic and act as responsible agents of nature.

We stand at a cross roads of being reborn as a nation in the 21st Century, a contemporary nation, but very much rooted in the rich and dynamic traditions of a multi-cultural heritage. A heritage which has survived because it believed in tolerance, sharing and honouring acculturation as a positive attribute of living societies. It is our challenge to learn from the lessons of the Indus and put back into its streams the energies of the mountains, plateaus, the plains and the deserts without discriminating on the basis of topography and learning from the river, its ability to accommodate diversity, adapt and give to the needs of the people and become a living phenomenon of nature.

Someone said, 'difference need not produce conflict any more than sameness produces solidarity'. How do we translate this wonderful piece of piercing wisdom in our lives. How do we ensure that human learning, whether in schools, or out of schools, formal or informal can move from adversarial interpretations of history to collaborative ones, respecting diverse histories and experiences for enriching societies and not otherwise? As suggested in an earlier colloquium, 'the construction of a true cultural pluralism thus supposes, in theory, the abandonment of intercultural antagonisms and the rise of a shared culture based on the acceptance of diversity' (1999). Cultural pluralism is not about addressing the rights of minorities but must be seen as a mainstream phenomenon for building social capital, recognizing the legitimacy of multiple identities as we must today of the inheritors of the Indus Civilization.

Finally, how do we translate the work of our great archaeologists and anthropologists like Professor Dani and Rafiq Mughal into books for children to emulate messages of heritage, strength in diversity, tolerance and exchange for enrichment? Evidence in history and nature, which stretches to fourth millennium BC and beyond, is a testimonial to the richness produced by diversity. Can we, the inheritors of the Indus do it justice?

Mr. Director General,

I agree with what you refer to in your speech that only dialogue brings us closer to peace and the dialogue for culture is a very powerful one. By looking for common areas of concern we

promote a basis for 'shared re-appropriation of heritage' ensuring mutual respect for interpretations. We look towards UNESCO as our partner in promoting these messages through our collaboration in the areas of culture and education.

I wish you every success in your deliberations.

ADDRESS BY

DR. ATTIYA INAYATULLAH
MEMBER EXECUTIVE BOARD, UNESCO



Mr. Director General, Ministers Mr. Tressler and Madam Zubida Jalal, Excellencies,

Ladies and Gentlemen:

It is with an enormous amount of pride and pleasure that I stand before you today at this International Colloquium on the Indus Valley Civilization. It is an affirmation by Pakistan that the United Nations Year of Dialogue amongst Civilization constitutes a profound human challenge, one that invites us to take cognizance of the interdependence of humanity and its rich diversity.

To you Mr. Director General, a very big personal thank you for making and keeping a promise made a year ago to be with us here today. We are proud to have you with us. We have great expectations that, under your leadership, UNESCO, the world's house of science, education, culture and communication will match up to the expectations of its member states, and assure you of Pakistan's fullest support in your difficult task, which you have rightly accepted as a challenge.

The last but not least our thank you is for your firm and unequivocal up front support, financial and technical, which has made this Colloquium possible, and without which it clearly would have remained my unfulfilled dream.

The Colloquium is in the competent hands of Minister Tressler and his Organizing Committee; it therefore remains for me to share my expectation that through this one year of the Dialogue of Civilizations we get an alternate paradigm to military and economic force for international relations. Globalization is not civilization and the military solution is no solution.

Ladies & Gentlemen,

Civilization is history's largest socio-cultural unit, a self-asserting, self-contained and self-sufficient entity with the twenty-first century role of reciprocal knowledge and human interactions.

The Indus Civilization is clearly one such entity. Its contributions are widely acknowledged, be it to exact and predictive sciences, fine artistic sensibilities or complex social structure. I, therefore, look forward to the outcome of the discourse of the galaxy of scholars gathered here with the expectation that from the civilization analysis emerges an inclusive approach of mutual understanding and tolerance among world cultures and civilizations.

I seek your indulgence for a few minutes more, and would like to refer to every Pakistani's roots, which we pride as the world's shared heritage. I am referring to the Indus Civilization. It is acknowledged for the cultural assimilation of different ethnic and religious groups, which over vast geographic boundaries and long periods of time ensured enduring peace and prosperity. It also accomplished the integration of heterogeneous tribes, which was secured by free trade.

Pakistan upholds the belief that Islam has for the last fourteen centuries been one of the leading creative forces of the planet. And a close look at our 5000 years old legacy, the Indus Civilization, reveals that its manifestations have both influenced and been influenced far and wide.

In today's Pakistan we seek to live with a sense of history, and apply the earlier mentioned influences of the Islamic and Indus Civilization in the attainment of peace. Our instrument is the seven point agenda of the Chief Executive, which, whilst fast-tracking economic revival and poverty alleviation, seeks to restore the dignity of every individual and create harmony amongst people. This we are committed to doing through the construction of a people-centered democracy, one which promotes pluralism and rejects cultural fundamentalism, ethnicity and intolerance.

Indeed, we humans have the endowment of civilization and I would like to make a call for open minds, heart and spirit. We seek unity in human diversity; the non-identical cannot be the evil other. The political and moral implications of demonization of other urge us toward the miracle of human dialogue and understanding of humanity's pooled cultural heritage. It is precisely this, which the Colloquium seeks to attain. My best wishes for its success.

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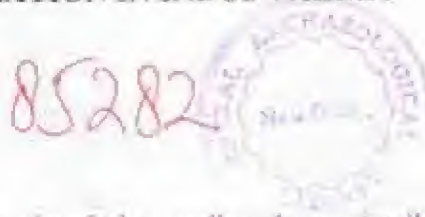
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RECENT FIELD WORK



ROLE OF ROHRI HILLS AND THAR DESERT IN THE DEVELOPMENT OF CIVILIZATION IN INDUS VALLEY



Dr. Nilofer Shaikh
Dr. Qasid H. Mallah
G.M. Veesar

INTRODUCTION

The archeological research on the Indus valley has contributed great wealth of information in which any forthcoming discovery is considered an addition. This present paper contributes fresh data in which a complete sequence of cultural development from two distinctive geographical zones of the Greater Indus Valley viz.: Rohri Hills and Thar Desert have been discussed. Among these distinctive geographical zones, the Thar Desert was previously considered as hindrance in the extension and expansion of the Indus Culture (Shaffer 1981: 65). On the contrary, most recently a significant empirical set of data has been collected from the Thar, Rohri Hills and its adjacent areas that has provided a full vision of historical cultural development from the Palaeolithic to the Indus period and continues into subsequent periods up to the recent times.

ENVIRONMENTAL SETTING

The Rohri Hills are a distinctive geographical feature and are mainly composed of limestone deposits with layers of chert nodules of generically brown, sometimes variegated color embedded into them. They are located in a sub tropical arid landscape of upper Sindh and cover an area of some 40 kilometers from North to South and 16 kilometers from East to West. The shifting sand dunes encroach and cover the hills in its southern extremes. Apparently, these hills merge into the desert south of Kot Diji after which they are scattered into desert up to the Thari town (Fig.1). The chert/flint nodules, which are embedded within the limestone layers, are also scattered on the hill terraces. This was a major source of attraction to the early inhabitants and has been continuously exploited from Palaeolithic to the Indus period.

The Thar Desert on the other hand is the continuation of Cholistan desert, in the east it extends into Rajasthan desert and its southern extremes submerge into Rann of Kutch. The color of the sand dunes is Grey, grayish-white or yellowish-Grey (Bagri et al 1992). The Thar Desert of Sindh comprises on the total 43,276 square kilometers. This region in its northern portions shows traces of prehistoric channels of Raini and Karo Naro submerging into Nara/Hakra River. Ancient Hakara/Nara Nadi flows into a narrow strip of alluvial flood plain that extends 5 to 10 kilometers in width, where Hakra/Nara has made numerous flood spill channels into smaller valleys among sand dunes, thus creating many oxbow lakes and provides ample opportunity for prehistoric inhabitants. It is here that several archaeological sites have been documented.

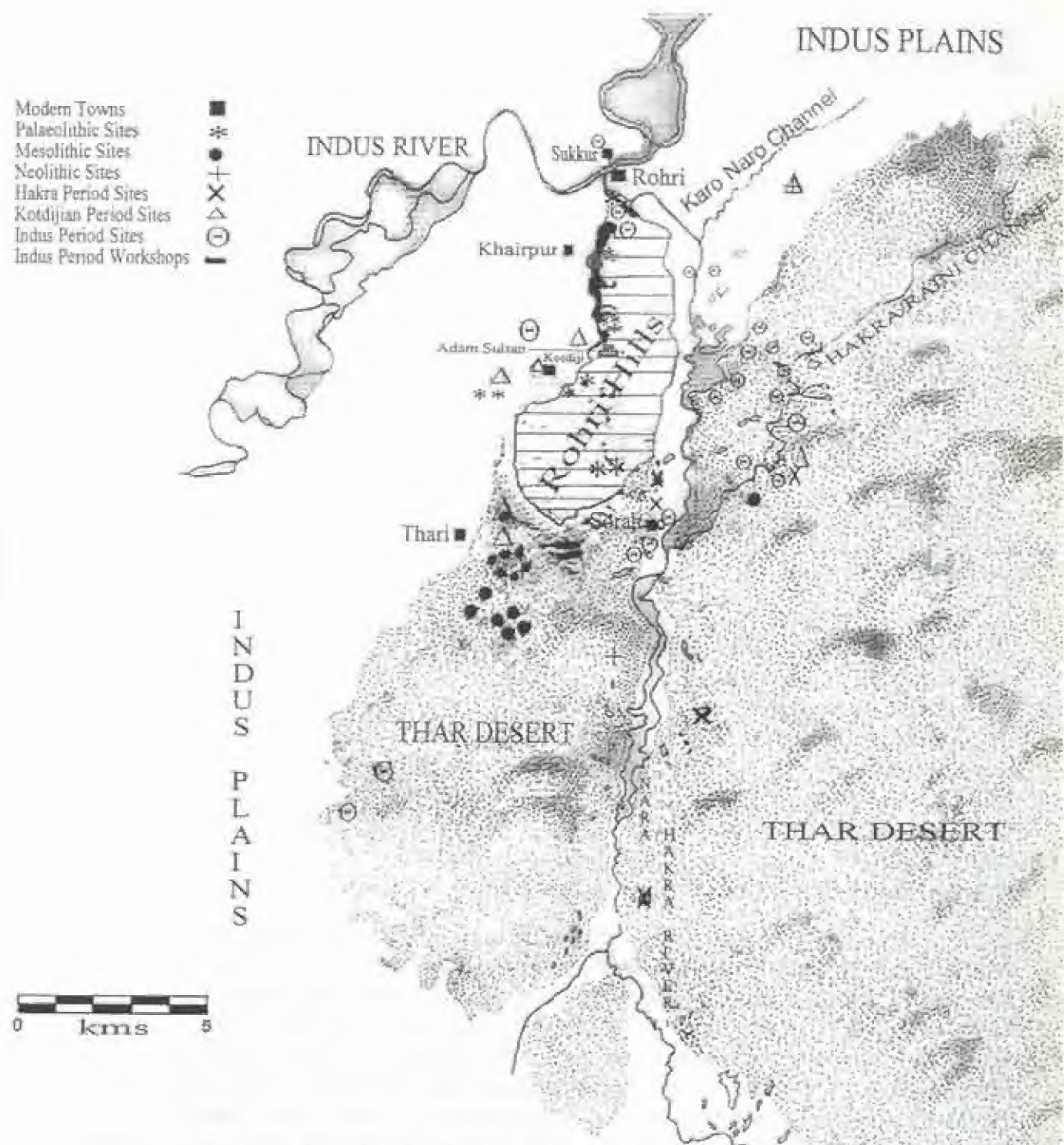


Fig. No.01: Map showing Palaeolithic to Indus Period Sites.

On the eastern side of the hills and Desert are the alluvial Indus Plains. The River Indus passes through the northern tip of the Rohri hills and flows west of it, whereas the Hakra skirts the western edge of the Desert. These plains are very fertile with diverse resources. The region between Indus Plains and Hakra River comprises of the alluvial plains, hills and the desert environment. It has furnished important evidences of archaeological sites.

PRESENT RESEARCH

This region: Thar and Rohri Hills, as a matter of fact apart from some previous surveys conducted on Rohri Hills by De Terra & Paterson (1939), Allchin, B. (1976) Biagi and Cremaschi (1988); the rest of the area remained unexplored. In the early 90's the Department of Archaeology Shah Abdul Latif University, Khairpur in collaboration with the Italian mission of the University of Venice conducted surveys on the Rohri Hills (the survey is still in progress). In the Year of 2000, the department of Archaeology at Shah Abdul Latif University independently launched another program of field research in the Thar Desert area concentrating in the first season on the western fringes of the desert overlapping the Rohri Hills. Both these intensive surveys have for the first time furnished evidence of cultural continuity and a link between Palaeolithic developments of the region and civilization that followed. The survey conducted by Dr. Rafique Mughal in Cholistan along the dry bed of Hakra had presented evidences of continuous sequence of development of the Indus Civilization between the 4th and beginning of the 1st millennium BC, but this region due to the combination of essential resources of the riverine Plains, Rohri Hills and the desert had complemented each other and helped in the nourishment, growth and expansion of cultures through ages. This research has produced the richest results ranging from Palaeolithic to historic times. This cultural sequence is unmatched in any region of the Indus Valley.

The recent survey on the hills and joining regions has furnished evidences so of 1449 sites/workshops or quarries. The sites range from Palaeolithic to the historic period but here only sites/workshops ranging from Palaeolithic to Mature Indus have been taken up. A glimpse of this spectacular progression of culture is given below: -

PERIOD	NO. OF SITES	WORKSHOPS/QUARRIES (Upper Palaeolithic)
Palaeolithic (Lower, Middle & Upper)	11	24
Mesolithic	20	-
Neolithic	3	-
Hakra	5	-
Kot Dijian	6	-
Mature Indus	19	1360
Total: 64		1384

Modern Towns
 Palaeolithic Sites
 Mesolithic Sites
 Neolithic Sites

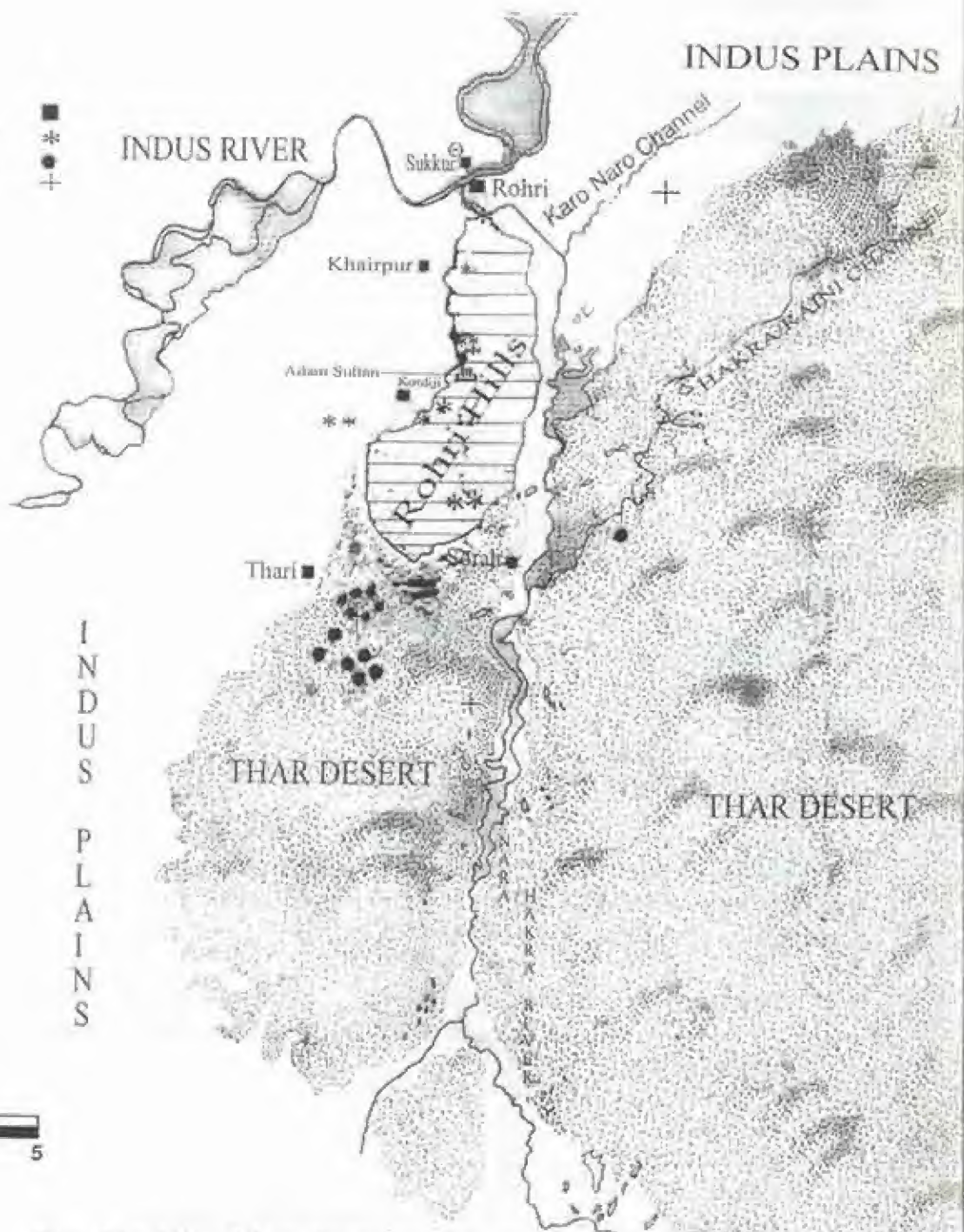


Fig. No.02: Map showing Stone Age Sites.

PALAEOLITHIC PERIOD

The oldest known cultural assemblage in the Rohri hills was of the Palaeolithic period. The remains of this period are found on the terraces of the hills. (Fig.2) The tool repertoire from the Lower Palaeolithic includes mainly hand-axes; these hand axes are dark brown in colour and are heavily patinated. The Middle Palaeolithic Industry consisted of Hand axes, scraper, bifacial tools, and picks. The tools of this period are lighter in color with little or no patina and the technology had improved. These tools are also lighter in weight and smaller in size than the Lower Palaeolithic. The Upper Palaeolithic material consisted of end scrapers and blade industry comprising of cores, Flakes and Blades. (Fig. 3)

The Chert used by them for making tools was collected from the terraces of the hills. Some caves are also present which may have been used as residing places but have not been explored yet. This assemblage of the Lower, Middle and Upper Palaeolithic is represented at 35 sites out of which 24 are workshops, which belong to the Upper Palaeolithic (Table). None of the Palaeolithic site has been found in the desert so far. The number of Upper Palaeolithic site is higher and its technology seems to have given a base for the stone tool technology of the pre and Mature Indus period as the preparation of tool out of core had started during this period.



FIG NO. 3 Tools of lower, middle & upper palaeolithic period.

MESOLITHIC PERIOD

This cultural phase followed the Palaeolithic and a new feature was observed. There was a shift from hills to the desert environs and the settlements of Mesolithic period concentrated in and around the lakes found in the desert. The sites appeared into clusters along the western edge of the Thar Desert to the south of Rohri hills; here these hills are scattered and are covered with dunes. A total of 20 settlements were mapped and many of them clustered together. Majority of these clusters is located nearby and/or around the lakes and in alluvial valleys. The occupation of clusters is at the slopes and or in the depressions of the sand dunes and these valleys are very suitable to watch on game. However, some clusters are also located on the top of sand dunes, (Fig.2). This situation depends upon the availability of resources in the vicinity.

The concentration of the artifacts authenticates the temporal stability and the abundance of subsistence resources at one spot. During survey some Neolithic tools were also gathered from Mesolithic site clusters.



Fig. No 4: Tools of Mesolithic Period

NEOLITHIC PERIOD

This cultural phase seems to be transitional and a total of three Neolithic period settlements were found in the desert region (Fig.2). Not a single site of this period has been found on the hills. From these sites the material include retouched parallel-sided blades, flakes and cores (Fig.5).

During this period the microlithic tools were also in use. However, these items are morphologically larger in size as compared to the Mesolithic tools and are more precise. Few potshreds were also found but due to heavy erosion they are unidentifiable. During exploration, it was noticed that the Neolithic objects were littered in the vicinity of other sites belonging to the Mesolithic, and Kot Dijian period settlement. Some of these sites are located approximately within 0.5 kilometers range. The location of sites indicated the exploitation of the alluvial valley and lake resources, which were suitable for food production. The combination of the Neolithic material with the succeeding periods indicated that the Neolithic people domesticated plants and animals and continued exploitation of the wild resources as well. The domestication, however, provided them high food return and were very much reliable subsistence resource through the year therefore they established permanent village.



Fig. No. 5 Tools of Neolithic Period.

HAKRA WARE PERIOD

Dr. Rafique Mughal first identified this cultural phase and it was the oldest known cultural assemblage that he discovered in Cholistan belonging to the 4th millennium B.C. He defined major characteristic of Hakra ware period as: (1) Pottery bits in the body wall of shreds. (2) Appliqué pottery for which Mughal described as "a thick coating of mud mixed with small pieces of pottery and applied to the external surface of vessel, it is the most distinguishing feature of pottery grouped under this category, (3) Incised pottery that contain triangular design, comb design and wavy lines "(Mughal 1997:94). The pottery similar in characteristics to the Hakra ware has been discovered from Thar regions ((Fig. 6 & 7).

Here this ware is represented at five settlements and all of these sites consist of surface scatter (Fig.8). The morphological analysis of many pottery shreds show similar manufacturing characteristics and properties as has been observed from the Cholistan sites. Concentration of Hakra ware sites was found in the valleys and near ancient river courses in the Thar region.



Fig. No. 6: Hakra Period Ware from Thar.

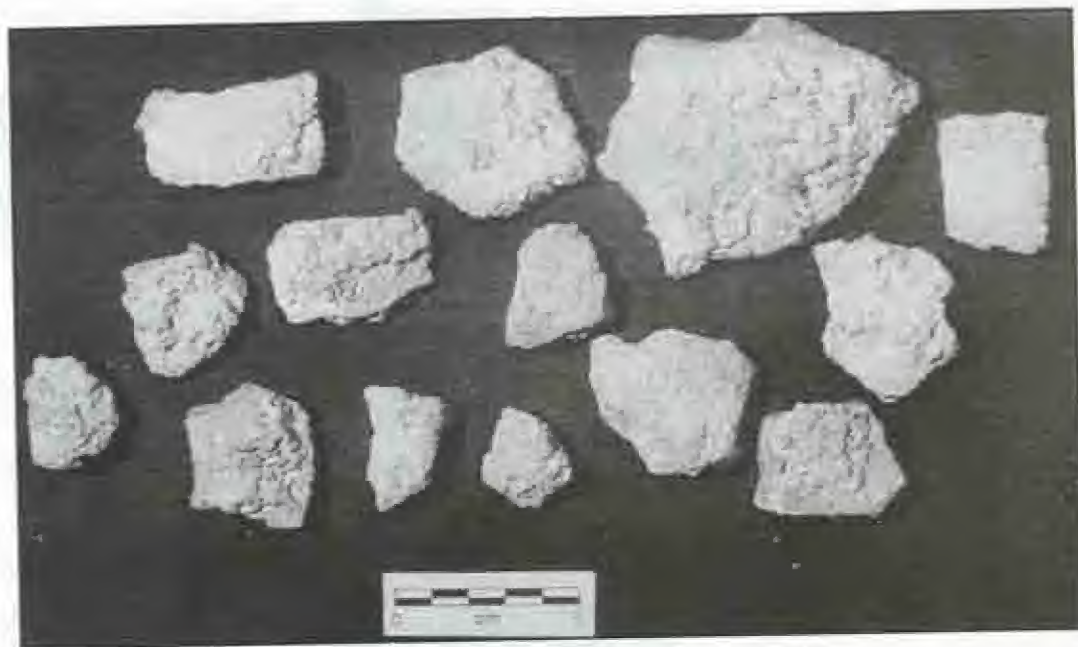


Fig. No. 7: Hakra Period Ware from Thar.

KOT DIJIAN

After initial excavation of the Kot Diji site, the distinctive cultural period was recognized as the "Kot Dijian Period." The concentrated distribution of Kot Dijian sites has been reported from the Cholistan region, where 40 sites have been recovered (Mughal 1980). In the recent survey, six sites have been recorded in and around Thar, (Fig. 8). Most of these settlements are permanent settlements and situated on the banks of the then existing River channels. These settlements are found as surface scatter and mound sites.

This was an era of technical complexity in which new geometrical sophisticated designs occurred on the pottery. Pottery itself was manufactured on the wheel and its body wall was thin and delicate with short rim-vessels with black bands around the neck that became very common tradition of the Kot Dijian culture. The material from the Kot Dijian sites in Thar included pottery with short trim, black band around the neck, lodged rim shreds with black horizontal & wavy lines, fish scale and buff ware. Other material included terracotta cakes, terracotta bangles, terracotta beads, lithics, copper pieces and shell objects indicating long distance connections. (Fig 9 & 10).

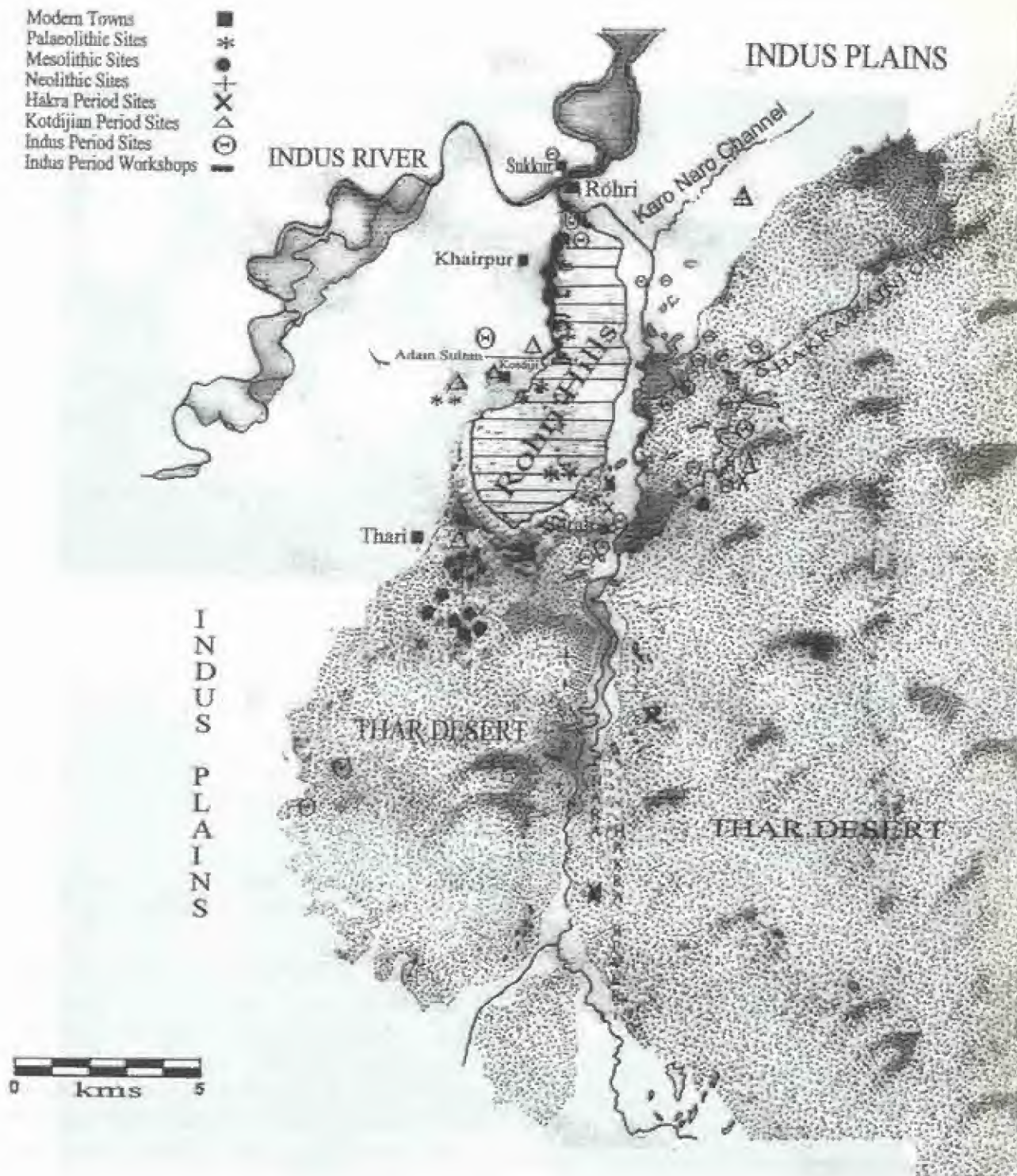


Fig. No. 6: Map showing Palaeolithic to Indus Period Sites.



Fig. No. 9: Kot Dijian Period Pottery



Fig. No. 10: Kot Dijian Period Pottery

MATURE INDUS PERIOD

This phase of cultural development is best represented at the various cites and towns of Indus Civilization. The major settlements relating to this phase being Moenjo Daro, Chanhu Daro, Harappa, Kali Bangan, Lothal, Lakhueen-Jo-Daro and others. All these settlements and others as well have revealed important evidences that reflect the development and cultural change of a complex urban civilization.

The material repertoire recovered from the sites I Rohri Hills and Thar include large number of stone tools, marine shell, various types of the semi precious stones, copper bronze, white disc beads, Terracotta cake, terracotta heads, terracotta bangles, banded chert weights etc. (Fig. 11, 12 & 13).



Fig. No. 11: Cores and Crested Blades of Mature Indus Period

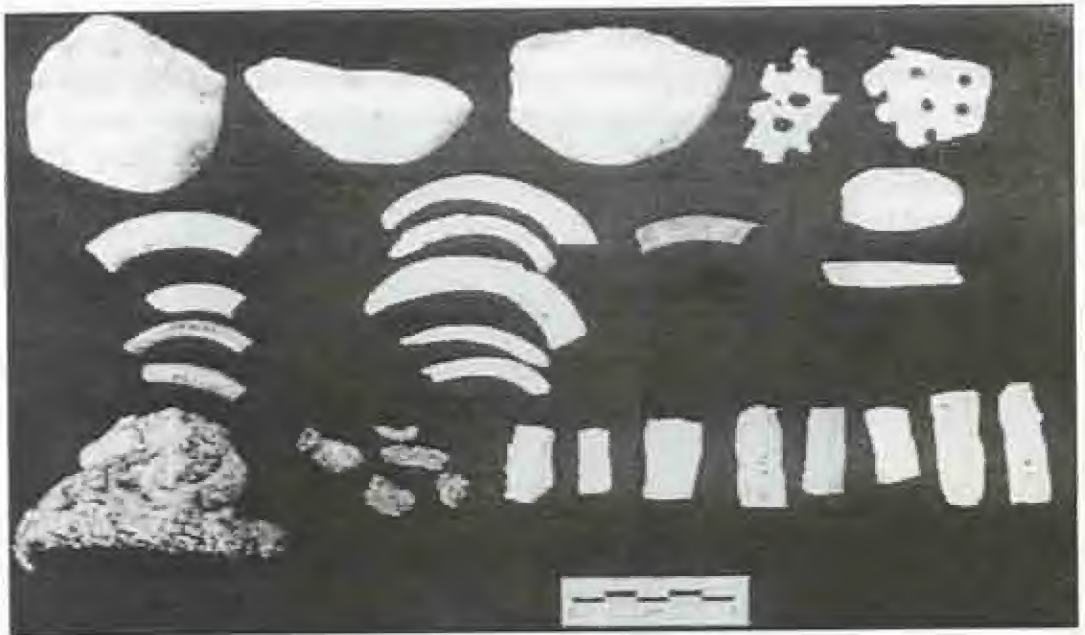


Fig. No. 12: Objects of Mature Indus Period.



Fig. No. 13: Semi Precious Stone and Steatite Disc Beads.

The most significant aspect of this period was the increase in the number of the settlements and profusion of Industrial areas. During this urban phase, maximum activity was noticed on the Rohri hills, where thirteen hundred and sixty (1360) workshops/quarries are recorded mainly on the western fringes of the Rohri hills between Rohri town and Adam Sultan. These quarry sites are seen as patches which Bridget Allchin (1976) mentioned as place where craftsman may have sat and worked. This view has been completely changed with the recent research. These were actually quarries and were excavated by the Mature Indus people to dig chert/flint nodules (Fig.14 & 15).



Fig. No. 14: Chert Nodules Extracted by Mature Indus People



Fig. No. 15: Chert Nodules Extracted by Mature Indus People

Besides this, the available evidence suggests that the Indus people favoured one variety of chert which was banded for making weights, this variety of banded chert was only found on the northern tip of the Rohri hills, where again large number of workshops/quarries were found (Fig.16). The Thar furnished evidence of a total of 19 sites of this period including settlements on mounds, surface scatter and workshops. At one site a different variety of chert nodules were noted which when heated it changed its color. Here kiln was also found where this chert was heated for making tools. In this sites



Fig - 16

raw material was found in and around these kilns. The kiln was made of limestone blocks where reddish soil and ash was present. This type of chert, which changed its colour after heating, was not found from any other part of the Hills (Fig. 17 & 18).



Fig. No. 17: Kiln for Heating Chert at Kandharki Site.



Fig. No. 18: Close-up of Kiln for Heating Chert at Kandharki Site

The discovery of huge quantity of chert from the sites of Indus civilization suggest the chert was multifunctional and was commonly utilized for cutting, drilling, scraping, plough activities and for weights. It was because of the workability of the chert and its requirement in the Indus settlements that more than thousand flint processing workshops/quarries/sites were found on the Rohri Hills and Thar Desert.

A very significant thing was noted and that was the negligible amount of finished tools. This area due to the presence of more than thousand workshop and quarries with very few finished tools is a clear evidence of this region playing a dominant role in internal and international interaction networks. The survey is continuing and it is expected that a large number of sites will be found in the eastern edge of the Hakra River. The towns of the Mature Indus period in the plains of Indus near the hills and Thar Desert viz; Kot Diji, Pir Sarhiyo, Lakhueen-Jo-Daro perhaps played an important role in the interaction network. The primary examination of all these sites indicated continuous occupation from Kot Dijian period of Mature Indus, which for the first time, a complete progression starting from Palaeolithic to recent historical times is found. This sequence is reconstructed on the basis of artifact repertoire associated with each period and potential subsistence resource niches available within the given region.

The evidence shows that different type chert especially plain chert and banded chert was commonly used. Before the Mesolithic period chert tools were manufactured larger and heavy in nature and the sites were only found on the Hills. But during Mesolithic period a shift of the settlements was seen from the hills to desert environment. The Mesolithic sites indicate a movement towards lakes and valley in the desert. The tool production was revolutionized into micro tools. The heavy retouching regardless of their size shows the comfort level of the craftsman's skill and experience with chert. The analysis of the material provided the fact that as soon as the people of this region became sedentary, the chert became commercial commodity that consequently established trade networks with neighbouring communities. Along this line, their experience of working on the chert was improved and intensified by Mature Indus period. Now Rohri hills were exploited to an extent they took the shape of a commercial industry. New techniques were applied including the heating technology and pressure flaking and excavating quarry pits for chert nodules. This is the time when chert technology was specialized in cores, flakes, blades and weights and was traded within Indus Valley and beyond.

It seems appropriate to argue here that Rohri hill chert resources were main attraction and the Thar Desert's rich source niches were supplementary. The combination of both alongwith the rich riverine resources have played a very important role and provided a strong base for the growth and development of human culture in South Asia and here after opens a new chapter within the history of Greater Indus Valley Civilization.

The survey is still ongoing and it is expected that large number of sites will be found to the south and on the both sides of the Hakra River. The new data may change the present interpretations and fill in the existing gaps in the knowledge. However, it would not be out of place to mention the difficulty in exploring this terrain, because of the sand desert environment and high velocity winds covering and exposing sites and again finding them on revisit.

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ROHRI - II AND QILA AKRAN HARAPPA SITES

Dr. M. Salim

Indus Civilization flourished along Indus River and employed chert stone as a raw material to make tools. This is evident when one visits Rohri hills, where thousand of artifacts are lying on surface-these were factory sites where early man flake tools and left rest of them as wastage. Some of these were picked up again and used as tools.

Previously De Terra and Paterson (1939:331) made studies on Harappan blades and cores. Then in 1974 (Salim 1997:76) a small collection was made by me near Rohri with Harappan and Palaeolithic artifacts. In 1975 Allchin (1976) joined by Goudie discovered more Palaeolithic and Harappan artifacts and studies were made on tools and geomorphology. Recently Baigi and Cremaschi (1988:421-433) explored Archeulian and Harappan sites Sheikh and Baigi (1997) and proposed chronology on the basis of patination. Since 1990 M. Kazi from Khairpur University has been doing research on Palaeolithic and Harappan collections from Rohri area (Pers. Comm in 1995). Cleland (1986:103) suggesting late Palaeolithic made a detail study of Harappan blade technology – Harappan continuity. A brief report on two sites is as follows.

ROHRI - II

I discovered the site on 7th August 1974. It is about 1.5 km from Rohri Railway station and is south of Bungalows and near Railway Loco Shed area. At the base is limestone with red soil on top and surface covered with artifacts. Chert nodules were used to make Harappan artifacts as follows: -

Blade core-	4
Blade -	10
Flake -	2
Total -	16

The longest blade is 13.5 cm and the smallest is 3 cm. Blade cores are 8 cm long and 4 cm thick 3 of them retains cortex. One has renewal of 15 blades with 5-mm width. Big nodules of chert were flaked into a few pieces, and each piece in turn served as core. Mass production of blades indicates its trade and common use by Harappans.

Chert Blades



QILA AKRAN, SON-SAKESAR VALLEY

Dr. Saif ur Rahman Dar discovered the site (Dar, in press) some years ago and a collection of Harappan pottery and chert blades was made. With Malik Sarwar Awan of Naushera, I visited the site on 17th March 2001. The Fort at height could be historic as Hindu Shahia pottery was also collected. There are remains of rooms made of sandstone slabs. From the surface a few shreds of Harappan pottery, stone weights and chert artifacts were recorded.

STONE COLLECTION

Raw material used is chert, limestone and quartz. The chert nodules are found in Sakesar limestone and are not of good quality as compared to that of Rohri. The collection consists of:

Stone Weight	- 3
Blade core	- 4
Flake cores	- 11
Flakes	- 12
Blade	- 2
Total:	32

The minimum length of blade core is 3 cm and of a blade is 5 cm. Flake core length vary between 1.2. Cm and 6 Cm. Blade scars on core range between 3 to 5 mm. The nearest Harappan sites in Salt Range are Musa Khel (Salim 1992:47) and Lill-Jabba graves (Dar in press).

Lithic technology is a good indicator to identify Harappan sites and shows domestic use for cutting, scraping as well hunting activities. Chert seems to be cheaper material for common than copper-bronze. The Harappan blade technology is one of the characteristics of this Civilization.

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ANTIQUITY OF THE SALT RANGE

Pre-and Early Harappan Evidence:

Dr. Saifur Rahman Dar

INTRODUCTION

The present paper endeavors to offer a summary of a short but extensive survey of a major part of the Salt Range carried out in March-May, 1994 by a 3 member team from the Directorate of Archaeology, Government of the Punjab. Almost whole of District Chakwal, major part of District Attock and the entire Son Valley of District Khushab was thoroughly explored for 40 days. It was resolved that there will be three separate reports one for each district. The author took upon himself the responsibility of writing the report in respect of Chakwal district. The same was completed and sent for printing to the Punjab Government Printing Press on 28th February 1995. Pending the publication of the report, I thought it appropriate to share this information with my colleagues through this Paper, as far as it relates to the pre-and Early Harappan evidence from the Salt Range.

The Salt Range is a land of beauty and home of martial people. At the same time this landmass is an enigma for geologists but it is an archaeological paradise. The area was partially explored by Sir Alexander Cunningham in the second half of the 19th century (Cunningham, 1972:6-37 & 188-191 and 1875:79-94) and by Sir Aurel Stein in the first half of the 20th century (Stein, 1937:45-46). On the whole the country has remained unexplored. Even Cunningham and Stein's surveys had touched only the eastern fringes of the area.

THE AREA OF OPERATION

The survey of the Salt Range was carried out for forty days (26th March to 4th May 1994). The area covered during the period runs through east, south east, south and southwest of Chakwal (Fig. 2) i.e. around Chakwal, Choa Saidan Shah, Malot, Katas, Kallar Kahar, Thir Chak, etc., some territory towards north of Chakwal city but mainly around Mehru Peelo and Nila-Dulla, towards north east the work was confined around Darogi, and the entire region along the western bank of Soan River from Shah Muhammad Wali south ward as well as along with south western fringes of Talagang Tehsil around Chinji & Lawa. Among other sites, the Team discovered many pre or Early Harappan sites. However, in the Son Valley, District Khushab, we encountered two sites with lithic material going as far back as Neolithic period. A cursory look at the Map at Fig.1 will show how a larger area north and west of Talagang and substantial track north of Chakwal needs to be probed further. This we intended to be taken up in the second phase of this Survey.

When the team started, its working knowledge about history and archaeology of the entire Salt Range was extremely limited and mainly based, as it was, on the information collected and published by Cunningham and further supplemented by Stein, as already mentioned above. This limited information was confined to about three archaeological mound namely Kutanwala Pind, Jahanan and Dulmial, two forts of Kasuk and Malot and three Kashmir style Brahmanic temples of Hindu Shahiya dynasty at Malot, Sassi da Kalara and Satgarha at Katas and some sculptural material from a Jaina (?) or Buddhist (?) Stupa at Murti. The chronological horizon, then, hardly extended beyond 650 A.D. Besides, we had some references to a handful of coins of earlier period too- going as far back as 2000 B.C. from places like Malot, Kusuk, Dulmial, Kutanwala Pind etc. But as no details were available nor any such site was properly visited and described even by persons like Cunningham and Stein, our picture of antiquity of the Salt Range hardly extended beyond 7th century A.D. However when the Team concluded its survey in 1994, the horizon of the antiquity of this region, even if we exclude our paleontological discoveries made at Bun Amir Khatoon, Samarqand, Thir Chak and Chahl Abdal, had expanded backward to at least 7000 B.C. Thus suddenly, the history of the Salt Range has jumped back from the times of Mahmud of Ghazna, the Hindu Shahiyas and possibly late Guptas to the Neolithic Period.

This survey is important not only for its paleontological, Neolithic and Early Harappan discoveries, but also for several other archaeological sites and monuments of historical period like forts, temples, stupas and numerous baolis or stepped wells. But in order not to digress from the main topic of this paper, details of the same are omitted here.

PALEONTOLOGICAL DISCOVERIES

The localities that yielded fossils of plants and animals included the sites of Samarqand, Chahl Abdal, Daryala Kahun, Thir Chak, Khokhar Zer and above all the site of Dhok Bun Amir Khatoon. Previously, the area around Chinji has been well noted for similar finds. Among the fossil localities, the site of Bun Amir Khatoon is, by far, the most important. It is extensive in size, rich in deposits and easily accessible. Experts, who have visited this site since its discovery, and with whom the author had the chance to meet, have confirmed that this is the largest site of fossil deposits so far discovered in the country. The fossils have been found mainly in two geological deposits. The earlier stratum is composed of sandstone whereas the later stratum is a thin conglomerate layer. Both are tilted at about an angle of 75 degree. The fossils comprise femur, hip, vertebra, tibia and fibula bones of some giant extinct animals. But fossilized bones of smaller animals are also numerous. The animals so far tentatively identified by experts include elephant, mastodon, huge deer, rhinoceros, and giraffe. These fossils have been tentatively dated to about eight million years back at a time when the large water reservoirs of the Salt Range - a remnant of the Teythus Sea, was drying up leaving behind

shallow ponds and lakes at deeper places like the ravines around present day Bun Amir Khatoon. These diminishing water resources forced both the smaller animals and their larger predators to get together around these shallow lakes. This explains the presence of fossilized bones both of hunter and hunted animals, together at one place. But, too much publicity, without making proper arrangement for the safety of the site and fossils available on the surface, did more harm than good to this unique site. Thousands of visitors from all over the country were attracted to the site. Every visitor took with him a handful of fossils from the site and hence depleted it of its priceless treasure. The area around Dhok Bun Amir Khatoon is also marked with further three groups of sites namely a) site yielding Neolithic polished stone axes or Celts, b) sites with pottery ware of Kot Diji period and c) Muslim Graveyard of early period together with a site yielding coins of Ghaznavid and later period.

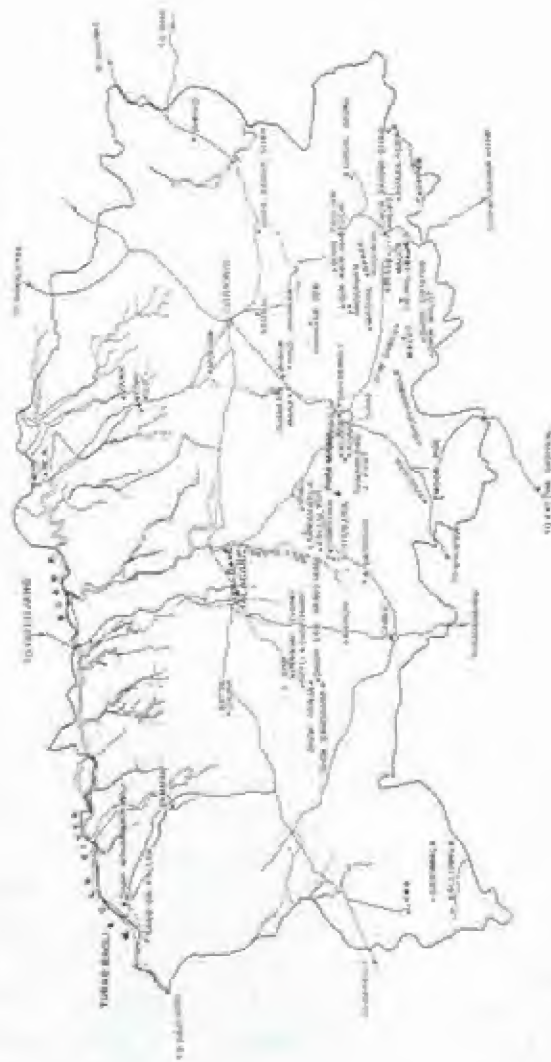
Major parts lots of fossil collections made from various sites were deposited in the Fossils Museum at Kallar Kahar, inaugurated on 15th April, 1994 and a representative collection, however, was deposited with the Directorate of Archaeology, Punjab in Lahore.

NEOLITHIC PERIOD SITES

Our important discovery was that of Neolithic material from at least three different sites at Andarwar near Bun Amir Khatoon, Kallu Kot near Thir Chak and Kutanwala Pind near Bhaun (Fig.2). The material mainly comprises polished hand axes, also called Celts, of granite stone. Five small Celts of different sizes came from Andarwar. One polished granite axe along with half portion of a stone mace head were picked up from the site of Kallu Kot, the site which otherwise has yielded a great amount of sculptural material of 6th and 7th century. A.D.

The single Celt from the extensive site of Kutanwala Pind was picked up from among the material which hardly goes beyond 200 B.C. Similar prehistoric hand axes were also discovered in the Greek city of Sirkap at Taxila and baffled its excavator (Marshall, 1951:484-85) It only came to the lot of Sarai Khola, some five kilometers southwest of Sirkap that similar material was found in its true context (Halim, 1972a & 1972b). The site of Andarwar, located, as it is, in a closed and isolated valley, appears to be the original home of the five Celts picked up from its surface, the other two Celts one each from Kallu Kot and Kutanwala Pind, like the Celts from Sirkap, appear to have been dropped there from some other near by sites. Unfortunately, we have not been able to locate any other site near Kallu Kot and Kutanwala. The early Indus or Kot Dijian period sites of Larrianwala Dher, Maghianwala Kas and Bagga Kot are not very far from Kallu Kot as Sarai Khola is to Sirkap. Thus prehistoric environment is well set around historic

ARCHAEOLOGICAL MAP OF DISTRICT CHAKWAL



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10	毕业院校	北京师范大学
11	工作单位	北京市第一实验小学
12	入职时间	2018年9月
13	合同期限	3年
14	工资等级	一级
15	社保缴纳	已缴
16	公积金缴纳	已缴
17	健康状况	良好
18	其他说明	
19	签字/盖章	
20	日期	2023年10月27日

period site of Kallu Kot. But, no such corroborating environment could be ascertained close to the site of Kutanwala Pind.

Admittedly, we have not collected enough evidence to built a complete kit of Neolithic culture in the Salt Range. But whatever limited evidence has so far been collected helps us in reaching some tentative conclusion. The available material of polished axes from these three sites can be dated safely between 7000 B.C. to 3000 B.C. and may appertain to the less known Neolithic phase of history of Pakistan. It was during this period when, for the first time, man started leading a semi settled life and domesticating animals and growing crops for his daily use. And, there could have been hardly a better place than the Salt Range for such a transformation for the 'Punjabicus' The early Man of the Punjab to start a settled life. The earlier phase of human history in this region, the hunter man of the Old Stone Age, is already well known from numerous stone tool localities on the bank of the Soan River. Thus, here in the wilds of the Salt Range, the long trail of history of life - from plants to animals, from humanoids to 'man' the hunter, to the 'man'- the food grower is being unfolded for the first time. The discovery of half a dozen sites of the Kot Dijian Culture (3000 B.C. 2500 B.C) further brings down this trail of human history to the path of civilization.

The site of Kallu Kot is the most extensive religious site (Buddhist or Jaina?) so far discovered in the entire Salt Range. The site appears basically to be a Buddhist or Jaina settlement. Among structures the only interesting piece is what looks like the remains of a Stupa base and its staircase on north, a few rooms of a monastery and two bases of votive Stupas (Fig.7). The most important discovery on the site, however, is one stone Celt of the late Neolithic Period datable about 4000 B.C. or even earlier. It was found east of the Stupa site (Fig 7) During one of the visits to the site, half portion of a black stone mace head of the same period was also picked up from the same area. Our Guide confirmed that he discovered one complete mace head from this site. This confirms the presence of prehistoric elements on this site. But, it is also possible that these prehistoric artifacts were picked up by some inhabitants of this site as 'curios' from some other prehistoric settlement nearby and left these here. As already pointed out, the Kot Dijian site of Larrianwala is at a short distance Northeast of Kallu Kot. A trial trench at some suitable place on the site may yield some useful information.

KOT DIJIAN OR EARRLY INDUS SITES

The vast area between river Indus and Chenab has so far, remained an archaeological blank as far as the Kot Dijian Culture and Indus Civilization are concerned. For long, it was believed that Harappa marks the northern most boundary of the prehistoric civilization of the Indus Valley. This is no true. The Kot Dijian Period sites of Khadianwala near Nankana Sahib in District Sheikhupura (Dar, 1983) and Sarai Khola,

near Taxila (Halim, 1972a & 1972b) have already reduced this gap considerably. However, a sufficient tract between Chenab and Soan rivers still remains unexplored. Our survey, of the Salt Range, limited though it was in time and space, has proved that this area too has remained active during the early Indus Period. What is most important here is the fact that here, and nowhere else, the emergence of civilization during 3000-2500 B.C. is a direct result of semi-settled life of man during the preceding 4000 years – the Neolithic Period of archaeological terminology.

In all eleven sites of the early Indus period have been identified in the Salt Range. These include: (i) Andarwar near Bun Amir Khatoon, (ii) Dhok Malot Raja Abdullah, (iii) Kutanwala Pind (also known as Dhanak) (iv) Bagga Kot, (v) Larrianwala Dher I, (vi) Larrianwala Dher II, (vii) Maghianwala Kas, (viii) Maraki Chow or Choa, (ix) Kotli Tibba, (x) Ratta Chura, and (xi) Kalu Wala Dher. The chief objects of discovery on these sites are potshreds and pottery vessels of characteristic Kot Diji types – with thin straight or slightly averted rims, single painted band and marks of striation, blades, cores and flakes of chert stone. At some sites, like the Larrianwala Dher II, fragments of terracotta bangles of grey color were also discovered. The most characteristic aspect of these early Indus sites is that with the exception of Dhok Malot Raja Abdullah all other sites are located at or near the confluence of two nullah, at least one of which is a perennial one. As most of these sites are located on top of flat lands surrounded by gullies and ravines on all sides, most of the cultural material has already been washed away leaving behind only a thin cultural deposit on the surface. Only the site of Larrianwala Dher II has a comparatively thick cultural deposit – which include a thick burnt layer of ashes and thicker deposit of Kot Diji type. All such sites, except one, are located along the northern faces of the Salt Range. The solitary exception is the site of Dhok Malot Raja Abdullah that is located under the shadow of Malot Temple at the foot of the southern side of the Salt Range. It is not far removed from the Right bank of the River Jhelum. Here, I will describe briefly only two more important sites as these offer features that have not been seen before on any other site of this period anywhere in Pakistan. Both are outstanding for their locations as well as contents (Dar, 1983:27,71-74.Fig.2, 5 &6)

DHOK MALOT RAJA ABDULLAH

This site can conveniently be reached by Motorway either through Kallar Kahar or Lilla Intersections. From either of these Intersections follow the narrow Lilla – Karoli – Kallar Kahar Road. At Dhok Burj, midway between Karoli and Tobah. An unmetalled linked road goes towards Dhok Malot Raja Abdullah near Dhok Chhapparr. The site represents ancient settlement on the northwestern side and a Cemetery on the southeastern side. The cemetery is bifurcated in two by an erosion gully (Fig 3). Here characteristic Kot Dijian pottery is mixed with such pieces, which give the feel of Harappan pottery. The graves are peculiar in shape and size. With the exception of two or

GRAVEYARD DHOK MALOT RAJA ABDULLAH NEAR KAROLI DISTRICT CHAKWAL.

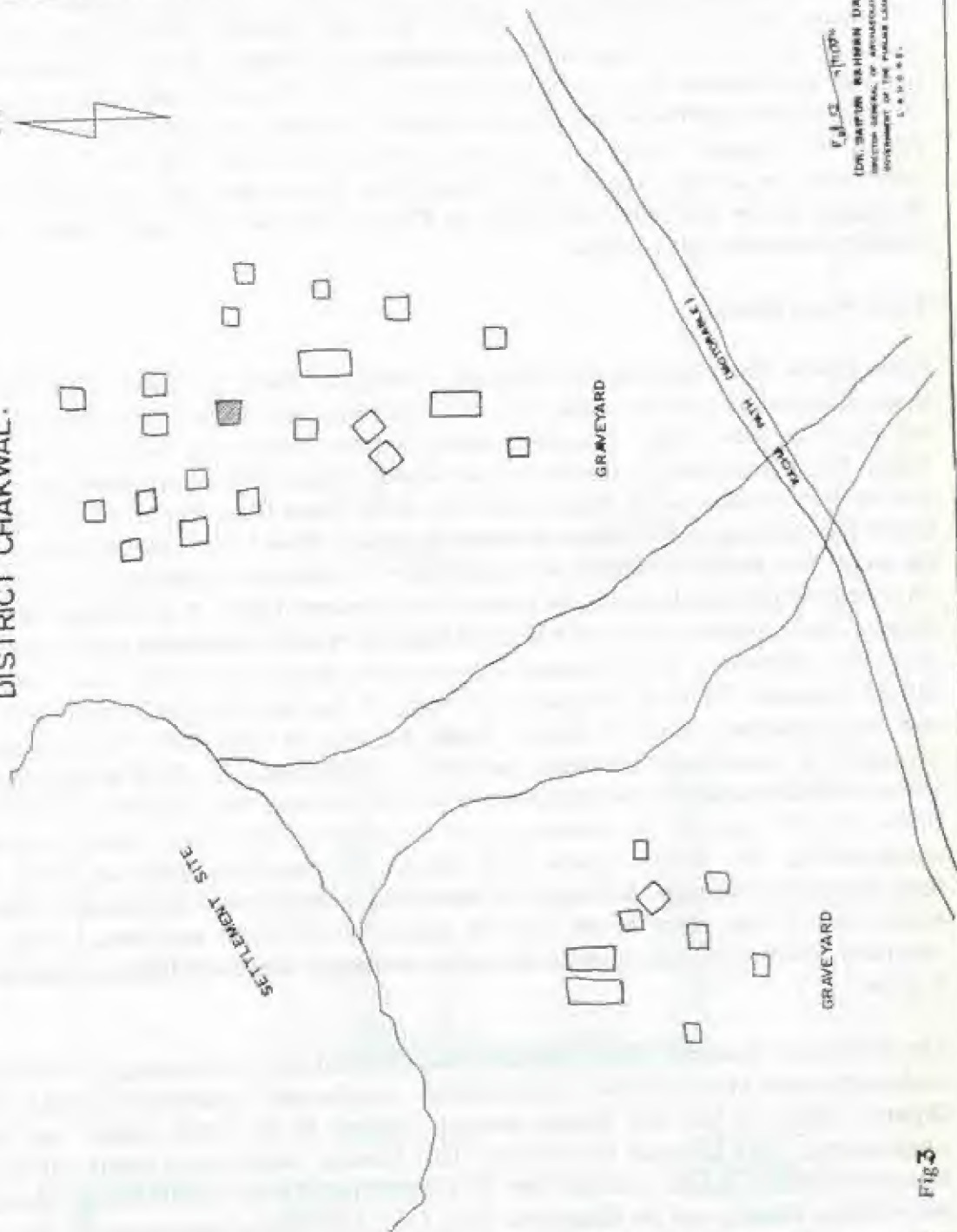


Fig 3

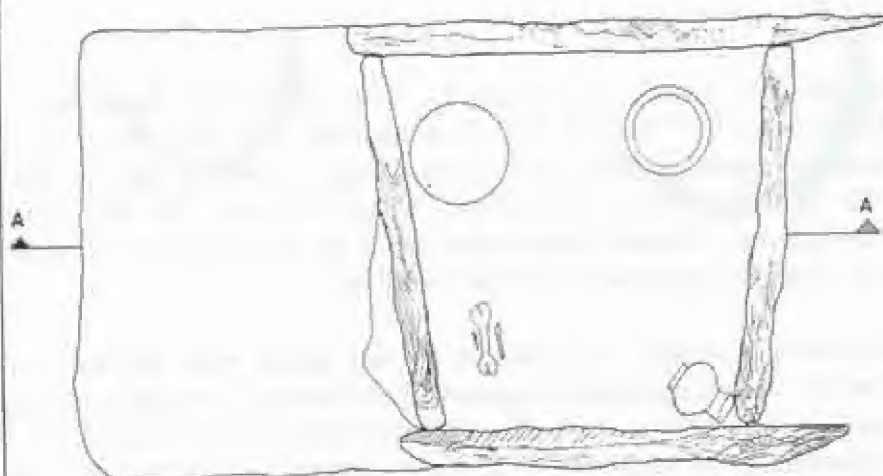
three rectangular graves, all other are square cysts or box type lined with stone slabs on sides except the top. The square or box type graves, on the average, measure about 1.8 x 1.0 meters (Fig.4). On top of one graves, globular miniature pot (Fig.5a) was found placed to indicate the grave itself. Some fragments of Gumla II type terracotta female figurine with pointed legs, set perpendicular to the body were also discovered (Dani, 1971:66-68.Pl.21a). The only grave excavated by the author yielded three Kot Dijian type pottery ware together with a few unrecognizable calcified bones (Fig.4 & 5). These bones were certainly not burnt before burial. This is for the first time that a graveyard of Early Harappan period has been discovered in Pakistan. These sites needs further probing through large-scale excavations.

KALU WALA DHER

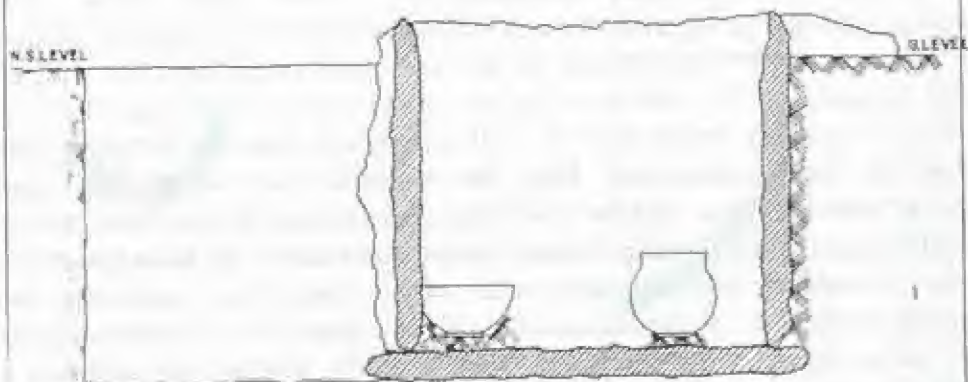
From Danda Shah Balawal on Talagang – Mianwali Road, a smaller road leaves for Lawa, a large town on the right bank of Trappi Nala and Narra on the right bank of a *nullah* of the same name. Travelling further northwestwards one comes across a point where Narra Nala meets a smaller stream named Bhindi Nala. Here above this junction and on the southern ban of Narra Nala is the Kallu Wala Dher (Fig.2). Local people say that if Son Sakesar is the highest mountain then Kalu Wala Dher is the highest mound in the entire Slat Range. It appears to be a double site a fortress on the top and a settlement on a ledge in the middle above the waters in the streams (Fig.6). It is a unique site for its being a small fortress on top of a high but isolated hillock commanding full view on all four sides. Situated at the confluence of two rivulets, the fortress on top of a carrot shaped hillock measures 30.60x28.50 meters externally. It has four circular bastions, one main and one subsidiary entrance (Fig.6). Inside the fort, at least three living rooms are traceable on the surface. The walls are built of round boulders. On a wide ledge, at a lower level in the middle, the remains of a few houses were also seen (Fig.6). Instead of round boulders used in the construction of the fortress, the houses below are built of comparatively well dressed square stone blocks. The surviving walls are hardly more than one course in height. Although, no associated material could be picked up from the surface due to late hours of the day, the author has no doubt that these houses were originally attached with the fortress above. but probing is suggested before a final verdict is given.

The prehistoric character of this fortress is confirmed from the discovery of a few white blades and cores of chert stone, some terracotta bangles and a quantity of pottery of Kot Dijians, which in the Salt Range context, appears to be partly earlier and partly contemporary with Harppan Civilization. This fortress constitutes a small military out post on the border of some ancient state. It is interesting to note that the famous Harappan site of Musa Khail is just 18 Kilometers away from Kalu Wala Dher but on the other side of the high mountains of the Salt Range. It is needless to say that before the regular

PREHISTORIC GRAVE DHOK MALOT RAJA ABDULLAH,
DISTT. CHAKWAL (PLAN, SECTION)



PLAN



SECTION A-A



Fig 4

SCALE

(DR. SAIFUR RAHMAN DARI)
DIRECTOR GENERAL OF ARCHAEOLOGY
GOVERNMENT OF THE PUNJAB, LAHORE

opening of the historic Khyber Pass for regular caravans, a passage through the Salt Range and Kurram and Tochi Passes used to be the only road that then connected the highlands of Hindukush in modern Afghanistan with the plains of the Punjab (Dar, 2000). The traffic between the Indus Valley and Soturagai in Afghanistan (Frankfort, 1978:¹) must have passed through Kalu Wala Dher. Here, this fortress must have acted as a watching for the security of caravans coming from or going to Shortugai.

CONCLUSION

As a result of this brief survey, the history of 'man' in the Salt Range has suddenly extended its frontiers from 7th century A.D to about 7000 B.C. This has given this area, for the first time, an important place on the archaeological map not only of Pakistan but the entire South Asia. If we look beyond the "history of man", the Salt Range offers promises and the chances of much greater antiquity in the field of genus of ancient forms of life during the first geological period i.e. paleontology.

Archaeological exploration and investigations of Salt Range were limited in time and resources. However, these limited investigations, have brought to light many significant aspects of history, archaeology and culture of the Salt Range hitherto unknown. Even, if we put aside paleontological discoveries, the Survey has pushed the history of the region back to an age when the "Soan - man"- the hunter and food gatherer, had already acquired the capability of food production and domestication of animals. The Neolithic cultural phase in the Salt Range needs more investigation in order to establish its relationship with the neighbouring regions and distant lands. Discovery of almost a dozen of Early Harappan sites of third millennium B.C. in the same region, shows how gradually this food producing man of the salt Rang knocked at the door of civilization by building cities and towns and develop his arts and crafts particularly the craft of wheel turned and painted ceramics. But how did this transformation take place and how many years it took to reach the thresh-hold of civilization? And, how the Neolithic Man broke away from his Soan predecessor? How the Neolithic man of the Salt Range was connected, in time and space with his wild Soan ancestors, on the one hand, and the more civilized successors of the Kot Diji Culture, on the other hand? All these questions cannot be answered confidently and adequately in the present state of our knowledge. But, these are the problems that have to be addressed by the new generation of archaeologists. More extensive survey of the whole area and some properly planned and problem oriented excavation of some selected sites is the only answer. This is a big burden, which archaeologists of my generation are leaving behind for their successors.

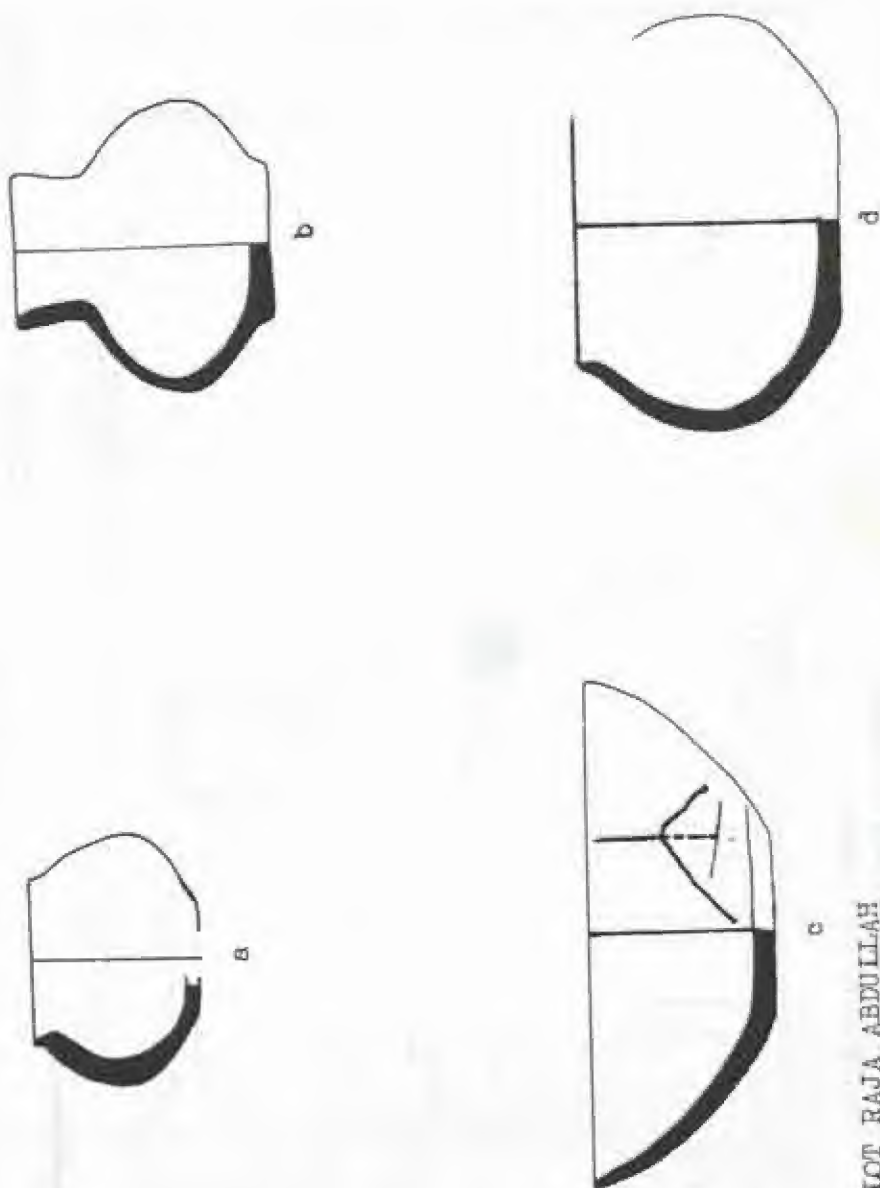
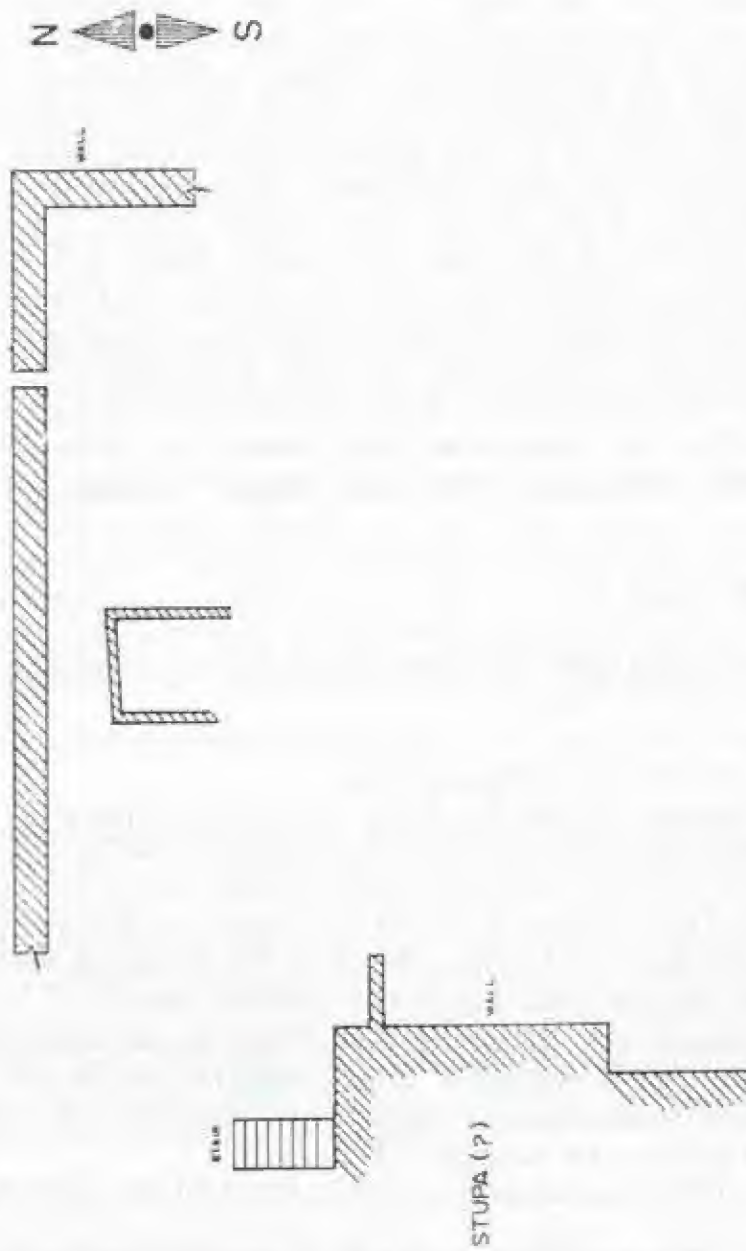


Fig. 5 DHOK MAILOT RAJA ABDULLAH
 Pottery from cist graves:
 a. From top of a grave.
 b-d. From excavation of a grave.

BUDDHIST(?) SITE AT KALLU KOT (THERCHAK)

DISTT. CHAKWAL

(PARTIAL REMAINS)



SCALE

Fig- 7

ACKNOWLEDGEMENTS

Syed Tanwir Abbas Jaffery, then Deputy Commissioner, Chakwal initiated the Survey of the Salt Range. The District Council provided the financial support for work in district Chakwal, while for the adjoining district Attock, support was received from Dr. Muhammad Rafique Mughal, then Director General, Department of Archaeology and Museums, Pakistan. Whereas Mr. Tariq Mahmud, then Secretary to the Government of the Punjab, Information and Culture Department very kindly provided necessary funds for publishing the report. In the field, the author received immense help from his Deputy Director Mr. Tariq Masud, Draftsmen M/s Naeem Ahmad and Muhammad Din, Photographer Mr. Imtiaz Ahmad. A small team of dedicated local journalist and educationists from Chakwal and a few social workers from other areas of the Salt Range proved of immense help. A few of them were: Prof. Anwar Baig Awan, Khawaja Babur Saleem Mahmud, Prof. Yasin Siddique, Malik Saqib Awan from Aima Maira, Malik Riaz Awan of Dhok Bun Amir Khatoon and Malik Sarwar Awan from Nowshera of Son Valley. They all have been a great source of information. The author is thankful to all of them.

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INDUS CIVILIZATION SITES DISCOVERED IN SANDAL BAR

Qasim Ali Qasim

The present paper is an attempt to summarize the recently discovered seven Early and Mature Harappan period sites in that part of Punjab, which is called Sandal Bar or Ration Doab - the land between two Rivers Ravi and Chanab). The Ration Doab/Sandal Bar embraces large tract of land only divided by boundary lines of the districts of Faisalabad, Jhang, Sheikhupura, Sialkot and Narowal. The soil of the Doab is by no means uniform in quality, but subject to certain reservation it may be generally described as a fertile loam, called "maira", a class of soil which forms a greater proportion of the whole. Roughly, the kind and density of tree-growth in it were the surest guides to the quality of any particular soil. The Bar in the past has often been spoken of as a country of extreme desolation but with modern irrigation system the area has become major crop production region.

Earlier only one Harappan period site at Manda in Jammu and Kashmir has been reported along the western bank of River Chenab, but during the course of our recent field exploration work in the Doab, especially in Sheikhupura districts, eight new sites of Early and Mature Harappan period have been added to the map of the Punjab. These sites are Rajanpur, in Tehsil Jaranwala while Khudian Wala, Rangpur Sheedian Wala, Piiran Wali, Naulan, Kacha Pind, Martinpur and Khichian have been located in Sheikhupura district.

RAJAN PUR

The site is situated in Chak 585 also known as Rajanpur on Jaranawala-Saiyidwala Road. It lies on the southern edge of village Rajanpur on 31° 09'30" North latitude and 73° 23' 00" East longitude. The mound 4.5 meters high from the cultivated fields. It roughly covered an area about 6 acres. It measures 210-meter north - south and 125 meters east to west. It has cultivated field on three sides except north. The northern side is bound with modern settlement of Rajanpur village. The mound is almost in circular shape. The central part of the mound is higher than sides. The soil is ash blackish. The surface of the mound disturbed by the local dwellers. Early Harappan pottery shreds and terracotta bangle fragments are scattered on the surface of the mound.

KHUDIAN WALA

The site is situated in Tehsil Wankand Sahib of district Sheikhupura at 31° 28'25" North latitude and 73° 45' 45" East Longitude. It lies about 6 K.m. north east of Nankana Sahib Town on the Southern edge of Nankana Sheikhupura mated Road, near village Ladaw and half K.m. west of Kudian wala village.

The irregular low mound with a maximum height of one meter. A large quantity of pottery shreds of Early and Mature Harappan period concentrated in the center of the mound. The mound is 325 meters long in North South and wide 210 metres in East west direction. Besides pottery, terracotta and shell bangle fragments and terracotta cakes were also collected from the surface.

(Editor's Note: This site of "Khudian Wala" was discovered and reported earlier by Dr. Saif ur Rahman Dar. For reference see Dar, S. R, 1983, Khadian Wala - The First Kot Dijian Site Discovered on the Right Bank of River Ravi, Journal of Central Asia, Vol. VI, No.2, 17-34)

RANGPUR SHAHEEDAN WALA

The site is located 8 KM north west of Nankana Sahib Town and about 300 meters north west of Chak 559 on the boundary of Sheikhpura- Faisalabad districts. The mound, situated 31° 27' 20" North Latitude 73° 35' 00" East Longitude, measured 630 meter north-south and 260 meters east - west with a height of 5 meters.

The irregular huge mound covered an area of 25 acres. Its central part is well preserved but the remaining portion is disturbed due to cultivation activities. A Muslim graveyard occupy its northern part. Some Kacha houses are built on southeastern part of the mound. Structures of a modern kiln are located on its western edge. A large number of Early Harappan and Mature Harappan Pottery is found scattered on the surface of the mound. The other finds includes terracotta bangle fragments and chert blades.

PIRAN WALI

The site Piranwali also known as Punjpir is situated in Tehsil Nankana Sahib district Sheikhpura. It is located about 1KM west of Baoli Piranwali and one KM east of Chak 371 on southern side of Nankana-Shahkot Road. The mound lies 31° 28' 30" North latitude and 73° 37' 00" East longitude. It has maximum length of 170 meter North to South and 145 meters width in East-West direction and a maximum height of 4.5 meters. The well-preserved irregular mound is surrounded by cultivated field except on its northern side, which is occupied by a graveyard. During the course of field operations Early Harappan and Mature Harappan pottery shreds were collected from the site.

NAULAN

Also situated in Tehsil Nankana Sahib of Sheikhpura district. The site Tibba Naulan lies 7-KM northwest of Nankana, 1 KM west of Darbar Kot village and 2 KM east of Chak 638. It lies 31° 29' 35" North latitude and 73° 39' 30" East longitude.

The mound covers an area of 6 acres. It is north to south 215 meters long and east to west 190 meters wide with a height of 4.5 meters. A Muslim graveyard occupied southern portion of the mound. Its north and northeastern part is undisturbed and well preserved. Wild growth and kikar trees covered the site. A water channel runs along the southern edge of the mound. A large number of Early Harappan and Mature Harappan Pottery was found scattered on the surface of the site. Beside pottery terracotta bangle fragments also found from the surface.

KACHA PIND

The site of Kacha Pind is situated on the north of Nankana - Bachiana metalled Road near village Kacha Pind and Chak 586 in Nankana Sahib Tehsil of Sheikhpura District. It lies 31° 25' 40" North Latitude and 73° 35' 40" East Longitude. The site is 340 meter long in east west direction and 135 meter wide in north south with a maximum height of 4 meters. The mound is badly disturbed by the local farmers. They have cut the site in the middle for cultivation. A tube well is installed in the center of the mound. Remaining part of the mound on the west is covered by the Muslim graveyard. Early and Mature Harappan pottery shreds are found in very small quantity.

MARTIN PUR

The Martinpur mound situated 10 K.m. west of Nankana Sahib and half KM south of Martinpur village at 31° 27' 30" North latitude and 73° 36' 10" East longitude. The irregular mound extending northeast to southwest on the old bed of river and covered an area 30 acres. It is 3 metre high above the riverbed. A modern graveyard occupied its northeast part. The mound is badly disturbed by rainwater channels and agricultural activities. Its southwestern part completely bulldozed and leveled for cultivation purposes. The surface of the site is littered with pottery of (Kot Dijian type) Early Harappan and Mature Harappan.

KHICHIAN

The site is situated on to the southern edge of Nankana - Bachiana road, 1 KM. north east of Chak Khichian and 3 KM east of Bachiana Town. It lies 31° 25' 30" North Latitude and 73° 35' 25" East Longitude. The mound is 80-meter long north - south and 65 meter wide in east - west direction with a maximum height of 1 meter. The site is badly disturbed by the local farmers by cultivation purposes. Only an area of 6 kanal is left undisturbed save for a grave on the top of the site. A large number of Early and Mature Harappan pottery is found scattered in the drain and cultivated fields. Beside pottery chert blades and their fragments were also collected from the site.

A report on the detailed study of these sites is being prepared and soon shall be published by the Department of Archaeology, Pakistan.

THE INDUS AND SARASWATI IN HISTORY, GEOLOGY AND ARCHAEOLOGY

S.P.Gupta

It is now well known that after the Partition of India in 1947 archaeologists in India and Pakistan both worked hard on the Harappan Civilization and by now discovered 2317 sites of which 1474 are found in India and 843 in Pakistan. These discoveries have also shown that as many as 1074 sites are located on the dried up course of river Saraswati and 231 on the Indus. Thus, it is now more than clear that the Harappan Civilization was the gift of two river systems, the Indus and the Saraswati, and not just the one, the Indus, as was thought till 1931 when Sir John Marshall published his book entitled *Mohenjodaro and The Indus Civilization*.

It is common knowledge that the Indus emerged from the waters of glaciers around the Mansarovar Lake in Tibet but it is only rarely known that the Saraswati at one point of time also emerged from the waters of the glaciers located in the Himalayas. Thus in the past, both the rivers have been flowing perennially simply because both were glacier-fed.

From archaeological points of view what was the time frame when both the rivers were flowing through the plains and emptying their waters in the Arabian Sea? This question is most vital since as noted above hundreds of Harappan sites are located in their basins. Archaeologically, the answer of this question is not difficult to give since the Harappan sites in their valleys are presently datable to 4th and 3rd millennia B.C. There are some sites belonging to the different historical periods as well but these are very few and far between. Thus, broadly speaking, the two rivers were fully active from at least 4000 B.C. through 3000 B.C. although these were flowing through a dry and desertic climatic zone in their lower areas.

The next question is as to what happened after 2000 B.C.? Two things happened. First, nothing happened to the Indus, it remained flowing perennially. Second, the Saraswati suffered a setback — after 2000 B.C. it started drying up.

All these are provable from three different sources of our information-literary, geological and archaeological. Thus, our approach here is multi-disciplinary.

LITERARY SOURCES

Indian literature is full of references to the river Saraswati-the Vedic, the Epic, the Puranic and the Classical. The oldest of this is the Rigveda. Its hymns were composed on the banks of the river Saraswati. These are around 50 times that this river is mentioned.



Some of the hymns clearly mention that the Saraswati emerged from the mountains to reach the ocean, a fact which is fully corroborated by geology and archaeology supplemented by satellite imagery. The Saraswati is described in the *Rigveda* as a great river rushing down from the mountains towards the ocean (VII) Mandala, 95th Sukta, 2 Richa (VII. 95.2) *ekachetat Saraswati nadinam suchir giribhya a samudrat* with tempestuous roar (VI. 61.8) breaking, and carrying down ridges of hills like lotus stems (VI.61.2), filling the realism of earth and the wide tracts of the firmament (VI.61.11). It is far superior to her companions (VII.95.4) and surpasses all other streams by her sheer majesty (VII.95.1) and glory (VI.61.13). This is fierce (VI.61.13), swiftest of the swifts (VI.61.13), mightiest of her class (VII.96.1). She is the best of the rivers (II.41.16), best of mothers (II, 41, 16) and even best of goddesses (II, 41, 16).

THE BRAHMANĪS

The later Vedic literature, however, gives a very pathetic condition of this river. During this period it shrank. It shrank enormously. It had now very little water to flow perennially and over long distances. It could no more reach the ocean. It got fanned out in the deserts of Cholistan. The *Aitareya* and the *Satapatha Brahmana* repeatedly mention this fact.

THE MAHABHARATA

In the Mahabharata we get many references to prove that by then the Saraswati, which was, joining the Arabian Sea, had fanned out, or lost, so to say in the deserts. It is the region of Vinasana (Salya 35.53). Archaeological and geomorphological evidence place the Vinasana in the deserts near the Derawar Fort in Bahawalpur region of Pakistan. Presently there is a shallow depression, almost parallel to the Indus, through which a canal, called 'Nara', is flowing. This was the ancient channel of the Saraswati as is held by most of the scholars in the world, including MR. Mughal and Louis Falm, two distinguished scholars working in Pakistan. The Saraswati, called Hakra in the local language in Cholistan, had reached the region just east of Rohri near a place called 'Thar' from near about which the Eastern Nara emerges.

19TH CENTURY WORK

In the 19th century the British explorers worked on this river and noted that the Saraswati river which flows near Thanos or Kurukshetra rises in the hills of Sirmur State, then debouches on the plains at Adi Badri, then disappears in the sands a few miles farther and comes up again about three miles to the south of Bhawanipur. The study mentions that it once again vanishes at Balchhar for a short distance to emerge once again and flows on in

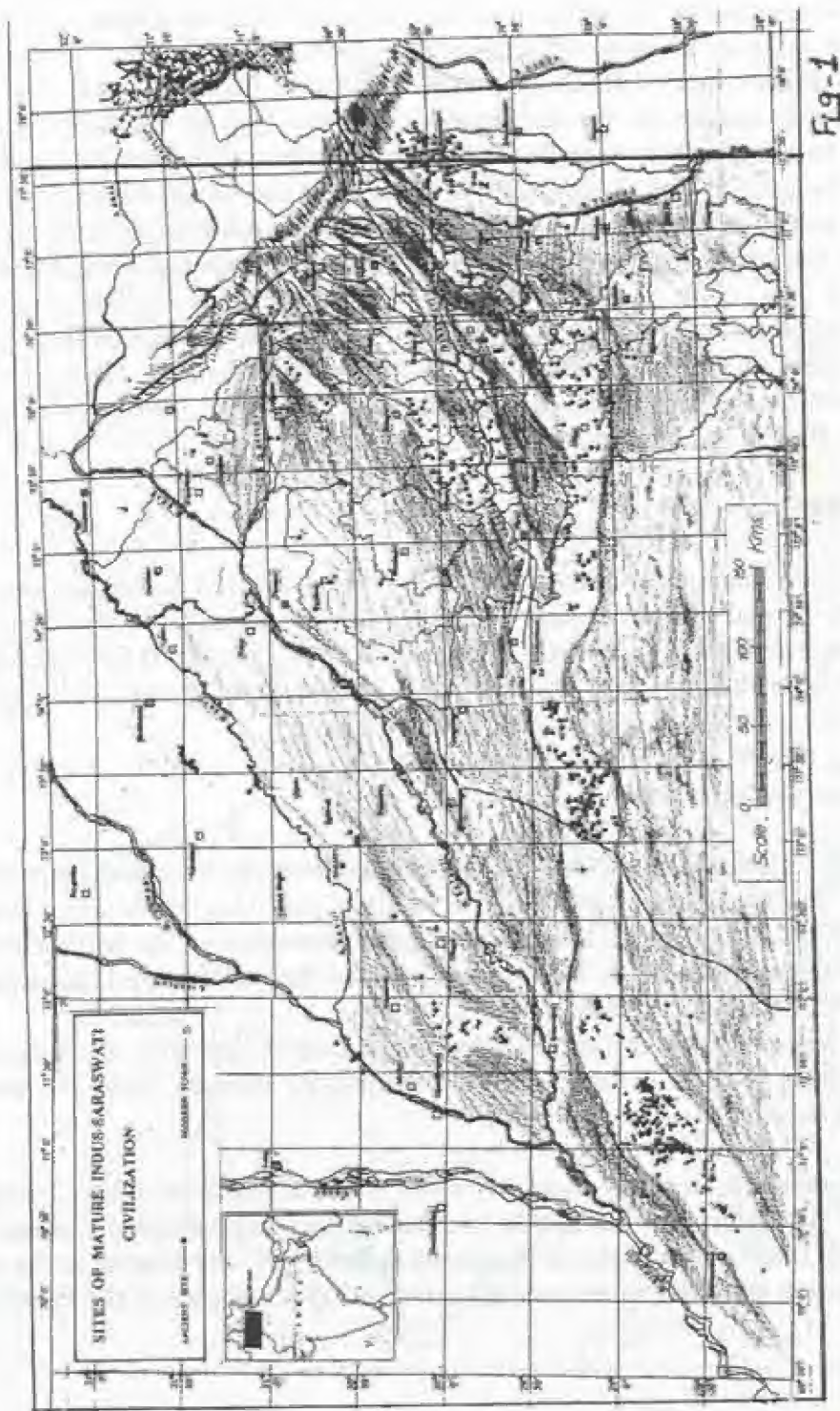


Fig-1

the south - westerly direction across Kamal until the Ghaggar in Patiala territory joins it after a course of about 110 miles. Running along the towns of Tohana and Sirsa it turns southward to enter Rajasthan in Ganganagar Distt. A little further it vanishes in the deserts of Bahawalpur. R.D. Oldham (1886) and C.F. Oldham (1893) were in fact the pioneers who worked on the Saraswati extensively both in the light of ancient and medieval literature and geology. However, some scholars have been calling the Saraswati river as 'Ghaggar', a river which starts near Kalka in the Shimla hills as a rain-fed small river and meets the Saraswati in Patiala to impose this name on the entire course of the Saraswati is hardly justified since Ghaggar is no where mentioned in the ancient literature of India. It may also be noted that since for thousands of years the Saraswati was seen by different people at different parts of the river in fragmentary condition each group gave a separate name for the stream they were seeing and experiencing. Hence, we have such names as Nara, Wahind, Hakra, Sotar, Ghaggar, Sarsuti, etc. starting from Sindh, Thar, Cholistan, Punjab and Haryana.

POST-INDEPENDENCE WORK

In recent years although several scholars and scientists worked on this subject two groups of scholars worked extensively and intensively on the geographic history of the Saraswati river: Yash Pal, Baldev Sahai and others, and V.M.K. Puri and B.C. Verma. Lately D.P. Rao, like Yash Pal and others, has also used Remote Sensing methods to work out the drainage of the Saraswati systems present and the past.

SARASWATI AND GLACIERS

Geologically speaking, only glaciers could provide water to Saraswati on perennial basis and glaciers were always confined to the Himalayas, they never came down to the Siwaliks. Thus, a search was made in the central Himalayas in the north-east of Paonta Sahib across the Siwaliks, in the Sirmaur Distt. of the present day Himanchal Pradesh. The method adopted was as follows:

First, the area-of-search in the Siwaliks was narrowed down on the basis of literary references and geological formations. It was located between Satluj in the west and Yamuna in the east. Plate L.

Second, openings in between these two rivers in the Siwaliks were then located. One is the site of Adi Badri near Markanda and the other is Kalesar near Yamuna. Tradition upholds Adi Badri as the source of Saraswati in the plains, and Kalesar as the entry-point for the Yamuna in the plains; above these points are the highlands of the Siwaliks. Fig. 2.

DRAINAGE PATTERN OF VEDIC SARASWATI IN HIMALAYA

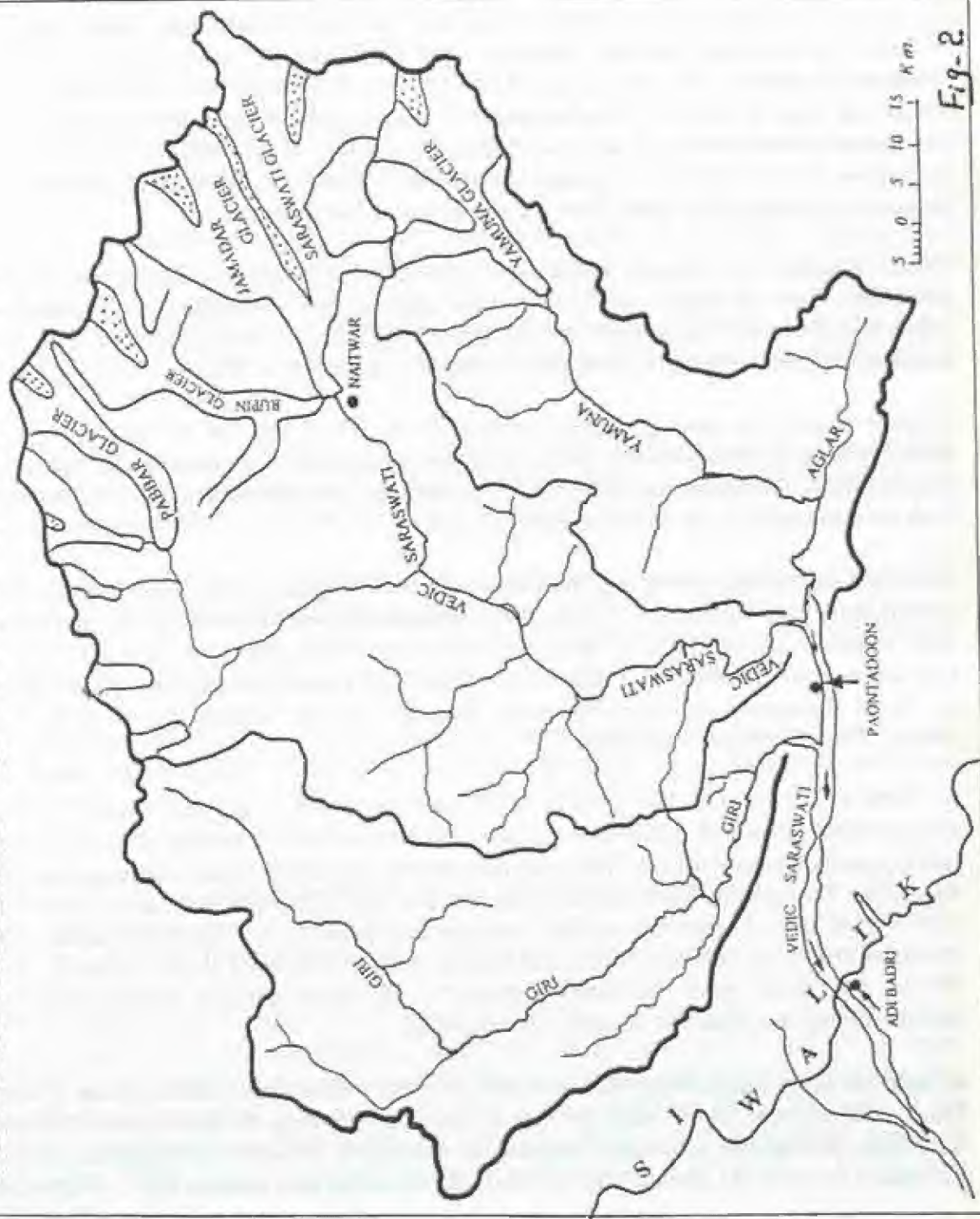


Fig-2

Explorers in the past had already worked out the courses of the Saraswati and Yamuna in the plains. In recent years Satellite imageries of these regions were taken, palaeo-channels of the Satluj and the Yamuna were identified and their relation with the Saraswati worked out by scholars like Yash Pal, Puri, Rao and others. It was found that Satluj was once a tributary of the Saraswati; it is only in recent times of historical period that Satiuj shifted westward and joined Beas, a tributary of the Indus. Archaeological, geological and geographical explorations and their combined studies also establish the process of shifting of the Satiuj from the southwest to extreme west.

Third, Yamuna was already studied by geologists, geographers, archaeologists and historians from its origins in the Yamnotri glaciers to its merger in the Ganga at Allahabad. In recent years Yash Pal and his colleagues have worked on this river also through the Landsat imagery of the palaeo-channels in the plains. Fig. 3.

In other words, the study of Palaeo-channels of the Satiuj and the Yamuna prove that anciently both the Satiuj and the Yamuna, the two perennial rivers, were the tributaries of the Saraswati, the former was then called Shatudri and the latter was called Drishadvati, both are mentioned in the Vedic literature. Fig. 4.

With this knowledge about the Saraswati and its tributaries, Puri and his associates moved in the mid-Himalayas to locate the signatures of the old channels of the Saraswati. Puri, therefore, concentrated on the glaciers and rivers emerging from them, and Verma concentrated on the terraces of these rivers. They hold a particular channel, called 'Tons' as 'Vedic Saraswati' or Palaeo-Saraswati. Puri and Verma worked out its geological history. Their findings are as follows:

A. There is a large watershed area in the Siwalik belt north of Kalesar, which is called 'Paonta Doon'. Plate I. It came into existence between 0.6 and 0.1 million years, i.e. in the late Upper Pleistocene period. There are five present-day rivers, which converge here the Algar, the Yamuna, the Tons, the Giri and the Bata. Fig. 2. Paonta Doon area is 'situated over a thick pile of sediments and the drainage here acquires a considerable width. The elevation difference between Paonta and Kalesar, a stretch of nearly 10 km, is hardly 12m (40 ft.). Obviously, since 'the valley sediment is very thick, probably a larger drainage was occupying this valley in the past', they surmised.

In order to study the drainage pattern of the five above mentioned rivers and the Paonta Doon area, both of which hold the key to our understanding of the Vedic or Palaeo-Saraswati, Verma did geological mapping of the region between the Yamuna and the Markanda rivers in the Siwaliks and beyond. He identified four terraces Fig.7., numbered

T, T₁, T₂ and T₃, T being the highest, hence oldest, and T₃ being the lowest, hence youngest. These are respectively: T₁ T₂ T₃.

- (i) Sudanwala Terrace : T
- (ii) Bata Terrace : T₁
- (iii) Garibnath Terrace : T₂
- (iv) Markanda Terrace : T₃

The discovery of Sudanwala Terrace (T) constitutes a major break-through indelineating the course of Vedic Saraswati. It contains a signature of this river that is completely masked now'. This terrace is located nearly 2 km S 10°E of Sudanwala, and nearly caps the top Siwalik Hills. The average elevation of this terrace is 660 m (2178 ft.) above MSL. Contituent pebbles of this terrace consists of different lithological compositions but quartzite and metamorphic materials are prevalent'.

The Bata terrace (T₁) is 'located almost linear in shape on the southern slope of Bata valley and occupies its higher portion'. Like the Sudanwala terrace, it is also composed of pebbles and boulders of quartzite and other metamorphic rocks.

The Garibnath terrace (T₂) is located in the most strategic position in Paonta Doon and lays North-North-East of Paonta- in N 15° E - S 15° W direction. The elevation difference from Terrace top (594m) to the present riverbed (408m) is nearly 180m(600 ft.). Here also the pebbles, etc. are of quartzitic and other metamorphic rocks.

The Markanda terrace (T₃) is 'located almost in linear disposition on the southern slope of Markanda valley, ESE of Nahan'. The pebbles of quartzite are in abundance here also. Archaeology and geology place the terrace in the Upper Pleistocene period. Rajaguru and Badam have worked on the geology and prehistory of the Markanda Valley terraces.

It is extremely significant to note that 'the present day provenance of the Bata and Markanda terraces consists of Siwalik rocks only; they do not contain any metamorphic rock and quartzite. The presence of these (metamorphic and quartzite) rocks as pebbles in T and T₁ terraces points towards the conclusion that another river that occupied these valleys had traversed a region where quartzite and other metamorphic rocks were found in abundance. It is also significant to note that younger terraces (T₂ and T₃) in these valleys do not contain even a single pebble of quartzite and other metamorphosed rocks, except along the present Yamuna course. This scenario indicates that provenance of the terrace material got restricted to Siwalik belt only. Moreover, Bata-Markand divide is only 30m(100ft.) high at present, which separates these rivers flowing in opposite directions'.

Thus, there is the clinching evidence 'of a huge river, flowing from the east to the west in the Paonta valley at a much higher level, prior to the birth of the present day Yamuna river, whose terraces are still observed along Adh Badri- Markanda link in the plains immediately to the south of the Siwalik belt'.

THE DRAINAGE OF PALAEO-SARASWATI AND SARASWATI GLACIER IN THE HIMALAYAS

The most crucial area for the drainage study of the Palaeo-Saraswati in the Himalayas is the Tons fifth order basin where lie thick strata of formations of quartzite and other metamorphic rocks at several places, the pebbles of which are found in the river terraces mentioned earlier. It may be noted that Tons river passes a very high average discharge which almost exceeds the combined discharge of Aglar, Yamuna, Giri, Bata and also Markanda rivers. Further, most significant criterion is the presence of a number of glaciers in this basin.'

The Saraswati seems to have originated in the geological times and passed through the prehistoric times of early to late Stone Ages. Puri and Verma feel that, *'All the evidences [geomorphological, glaciological and geological] point to only one occlusion that the present day Tons was in fact the Vedic Saraswati in its upper reaches. This river was in existence during Upper Pleistocene period as it was fed by glaciers that had descended to much lower limits in Garhwal Himalaya than the present day level due to the influence of Pleistocene Ice Age'.* Presently the Snowline is farther and on higher altitudes than what it was during the Pleistocene. In fact the glaciers in this region, including Gangotri, have been and are being fast receding.

The origin of the Palaeo-Saraswati lies at 5-km south - west of Naitwar. Situated on the confluence of the Rupin and the Tons rivers, the former emerging out of the Rupin Glacier and the latter emerging out of the Glacier named 'Saraswati Glacier' by Puri. The Saraswati Glacier was 58.8 km in length that possessed an average width of 3.5 km, covering an area of 205.8 km.' Fig. 2.

From Naitwar the Palaeo-Saraswati, same as modern Tons, flowed for 40 km in southwesterly direction where it met another glacier-fed river called 'Pabbar', after the name of the glacier. From here the Palaeo-Saraswati took a southerly route and travelled for 100 km before entering the region of Paonta Doon. It is here that the Palaeo-Saraswati joined the Algar, the Yamuna and the Giri rivers coming to Paonta Doon from northwesterly region. From here it took a course that is aligned along south of Kasis, Garibnath, Paonta and Bata valley, i.e., west to south-westerly direction and flowed over the raised and filled platform of the Siwaliks.' In the third and last stage, when the Palaeo-Saraswati reached the Bata valley, it took the southwesterly swing and 'entered the plains through Adh Badri'. In other words, at this point of time, there did not exist the

so-called 'Yamuna Tear' near Kalesar for the Palaeo-Saraswati to escape into the plains, Adi-Badri was the only first available gap in the Siwaliks for the Palaeo-Saraswati to descend into the plains. Fig. 2.

Here, it may be noted, that next and close to it is the Markanda valley. 'The field evidences suggest that the area between Garibnath-Kalesar and Markanda valley was once filled with a huge pile of fluvial sediments. The main drainage of Vedic Saraswati followed this terrain and oscillated between present-day Adh Badri and Markanda valley due to tectonic activity whereby the Siwalik belt was uplifted. In due course of time, it is possible that it was entering plains from Adh Badri as well through Markanda conduit'. Here it may be kept in mind that the Kalesar gap with 'Proto-Yamuna', which was a tributary of the Palaeo-Saraswati, was not at all active at this point of time, here there was no flow which could give rise to the present-day Yamuna. Fig. 5.

'From Adh Badri region, the Palaeo-Saraswati took the southwesterly course and reached Kurukshetra. From here it turned to slightly westerly direction and met the monsoon-fed Ghaggar, which emerged from the hills near Shimla. Around 25 km south of Patiala, the Tibetan glacier fed Perennial River Satiuj joined this course of the Saraswati and made it the mightier of the mightiest river with enormous quantity of water flowing through a very wide channel. It was certainly the case from 4000 B.C. through 2000 B.C.

Puri feels that 'consequent to erosion and tectonic activity, the Vedic Saraswati shifted its course finally from Adh Badri conduit and occupied the present-day Markanda valley' which is close to Adi-Badri.

THE YAMUNA TEAR: ITS ROLE IN THE SARASWATI'S DISAPPEARANCE

It brings us to the question of Desiccation of the Saraswati and the role that the Kalesar Gap and Yamuna Tear played. In course of time Neo-tectonic movements and climatic changes gripped the catchment area of the Palaeo-Saraswati. According to Puri six major episodes took place.

Around Kalesar there is what is called 'Yamuna Tear fault' Plate I, which has always been prone to tectonic movements and great disasters. This tear 'got activated after Vedic Saraswati came into existence' due to which the Proto-Yamuna left the Saraswati and started flowing through the Kalesar conduit and became the Drishadvati of the Rigveda fame. It soon became a tributary of the Saraswati (Yash Pal's Y2 channel) after flowing past Hissar, Bhadra, Nohar, etc. and joining the Saraswati near Suratgarh in Rajasthan.

Episode II is marked by the upliftment of the Bata-Markanda Divide by about 30 m (100 ft.). It created such a critical situation in which the rivers like Bata had to change their direction of flow, almost in the reverse direction.

Episode III is the result of the Episode II which changed the slope and 'reversed the drainage of Bata from west to southeast and south' resulting in the change of Saraswati water flow, most of it now joined the Palaeo-Yamuna or Drishadvati and made it a perennial river. The Saraswati was now completely depended on the monsoon precipitation and the Satluj water. This was the beginning of the end.

In Episode IV new tectonic activities shifted the Palaeo-Yamuna or Drishadvati (Y2 channel of Yash Pal) in the plains further to the east, making it an independent river now called Yamuna (around 1500 B.C.-1000 B.C. period of Painted Grey Ware), which are Y3 channel of Yash Pal, flowing past Bharatpur and merging into Chambal. Fig. 3.

Soon new shifts took place due to fresh tectonic movements and the Yamuna changed its course to present-day Yamuna flowing past Mathura Fig. 3, and joining the Ganga at Triveni in Allahabad.

The Episode V is marked by the change of the course of river Satluj. Around Ropar (Modern Roopnagar) it took the 90° westerly swings, and slowly and gradually met the Beas in 12th century A.D. at Bhao-ka-Pattan (between Kasur and Ferozpur). Later on the confluence shifted to Hari-ka-Pattan in the 16th century. It is interesting to note that during the last 100 years the Satluj has shifted its course westward by almost 16 km. from Budha Nala near Ludhiana. Satluj has been a most unfaithful river whose history can be compared in Asia only with the Oxus, which also shifted its course drastically, first it discharged its waters in the Caspian Sea then took a sharp turn and started emptying itself in the Aral Sea.

Episode VI is marked by the disorientation of the Vedic Saraswati. It was the 'cumulative effect of all the five episodes viz. reactivation of the Yamuna Tear, constriction of the catchment area of the Palaeo-Saraswati by 94.05%, emergence and migration of river Drishadvati towards south-east acquiring the present day Yamuna course and finally shifting of Shatudri (Satluj). Fig. 4.

It is now clear as to why the *Rigveda* described the Saraswati as a 'mighty river flowing from the mountains'; at one point of time it did emerge from the waters of the glaciers and it had also the water of the perennial river Satluj emerging from the waters of the Tibetan glaciers. It is now also clear as to why the *Mahabharat* mentions it as getting lost in the deserts; at a later date the perennial Saraswati lost the waters of the glaciers and also of the Satluj. Now it is only a monsoon-fed disjointed river of a series of dried

up lakes even the *Tirthas* such as Kurukshetra and Pehowa on its bank in Haryana have been abandoned by the Saraswati, these are fed with waters brought from man-made canals.

ARCHAEOLOGY

By now archaeologists in India and Pakistan have been able to identify as many as 2317 sites of the Harappan Civilization. Most of them have been collected by G.L. Possehl in his recently published book *Indus Age*. Those which are missing there we have added from our data bank. This data show the following:

Chart-1

Total No. of Harappan Sites in India and Pakistan	= 2317
Total No. of Harappan Sites in India	= 1474
Total No. of Harappan Sites in Pakistan	= 843

Chart-2

Total No. of Harappan Sites on Saraswati- Hakra	= 1074
Total No. of Harappan Sites on Saraswati- Hakra in Pakistan	= 426
Total No. of Harappan Sites on Saraswati- Hakra in India	= 648

Chart-3

Total No. of Hakra Sites in India and Pakistan	= 123
Total No. of Hakra Sites in India	= 1
Total No. of Hakra Sites in Pakistan	= 122

Chart-4

Total No. of Early Harappan Sites (Kot-Diji-Sothi) in India and Pakistan	= 309
Total No. of Early Harappan Sites (Kot-Diji-Sothi) in India	= 179
Total No. of Early Harappan Sites (Kot-Diji-Sothi) in Pakistan	= 130

Chart-5

Total No. of other Early Harappan Sites (Amri-Nal and Damb-Sadapat) in Pakistan	= 192
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85282



Chart-6

Total No. of Mature Harappan Sites in India and Pakistan	= 986
Total No. of Mature Harappan Sites in Pakistan	= 416
Total No. of Mature Harappan Sites in India	=570

Chart-7

Total No. of Late Harappan Sites in India and Pakistan	=1047
Total No. of Late Harappan Sites in India	= 985
Total No. of Late Harappan Sites in Pakistan	= 62

CONCLUSION

The above mentioned data would show that the Saraswati was the living river during the 4th-3rd millennium B.C. otherwise we could not get more than a thousand Harappan sites in its basin starting from Haryana in India through Sindh in Pakistan.

It also proves beyond doubt that the Harappan Civilization was the gift of the Indus and the Saraswati put together and not exclusively either of the two rivers. From 2nd millennium B.C. the Saraswati started drying up due to the neo-tectonic movements in the Himalayas, which affected the geomorphology of the Sirmour Distt. of Himanchal Pradesh drastically. It changed the existing drainage pattern of the rivers, the Adi Badri outlet of the Saraswati got completely closed due to the upliftment of the Markanda-Bata Divide; today the Saraswati river is only rain-fed, hence even in the rainy season it does not have enough water to travel beyond Suratgarh in Rajasthan.

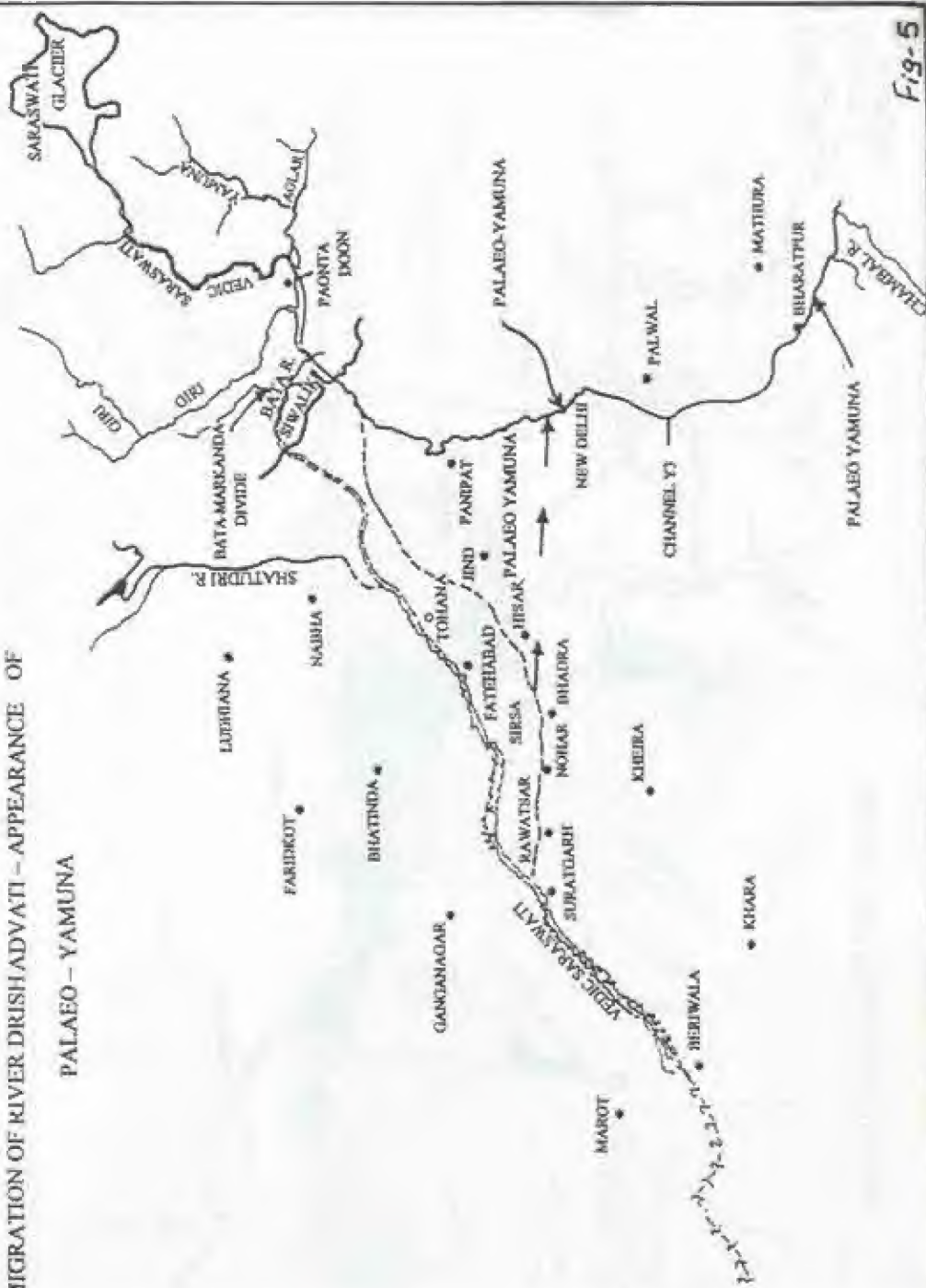
REACTIVATION OF YAMUNA TEAR AND EMERGENCE OF RIVER DRISHADVATI

The map illustrates the Yamuna River basin, showing its course from the Himalayas to the Bay of Bengal. Key features include:

- Glaciers:** Yarabgo Glacier, Kirth Glacier, Jakhone Glacier, Sakaswati Glacier, Yamuna Glacier.
- Dams:** Bakra Dam, Nagarjuna Dam, Nagarjuna Dam, Nagarjuna Dam.
- Cities:** Lucknow, Kanpur, Allahabad, Varanasi, Patna, Ranchi, Bhubaneswar, Cuttack, Bhubaneswar, Cuttack, Bhubaneswar, Cuttack.
- Other Features:** Yamuna River, Ganges River, Bay of Bengal, Yamuna Tear, Yamuna Dam, Yamuna Dam, Yamuna Dam.

Fig. 3

MIGRATION OF RIVER DRISHADVATI - APPEARANCE OF PALAEO-YAMUNA



MIGRATION OF SHATUDRI COURSE

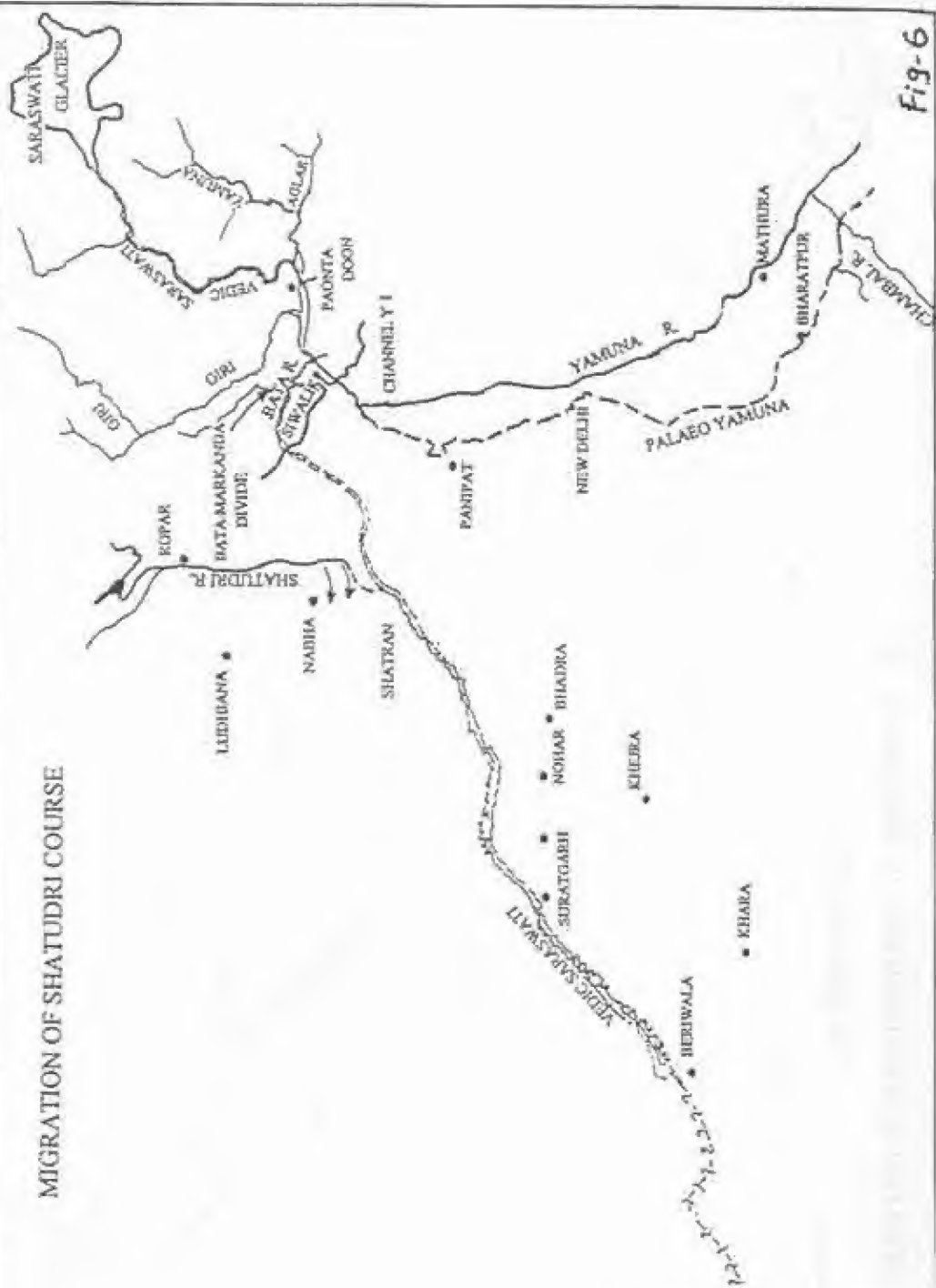
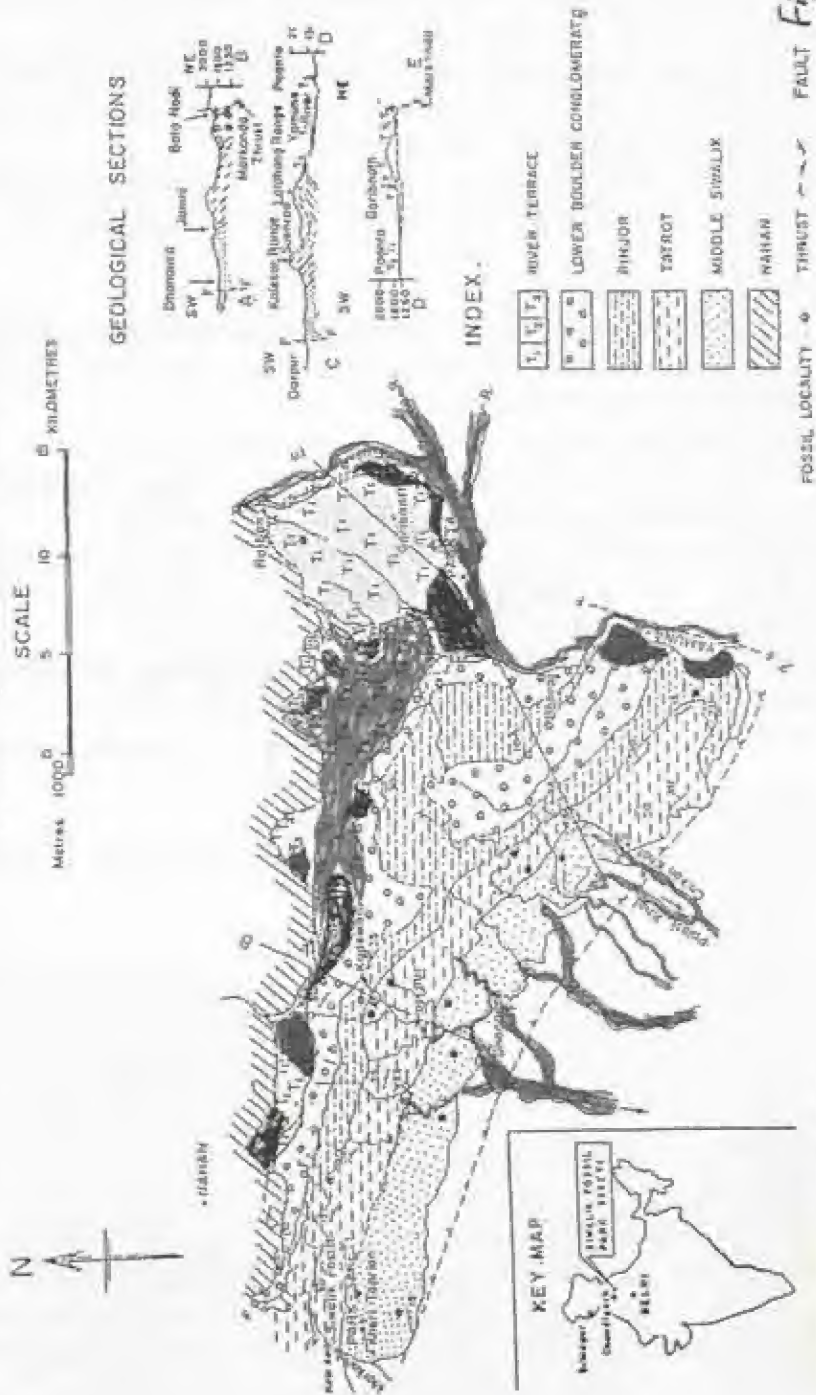


Fig-6

GEOLOGICAL MAP OF THE OUTERSIWALIK BELT BETWEEN THE RIVERS YAMUNA & MARKANDA
HARYANA & HIMACHAL PRADESH



O.C. V90046, V.21.1, P.22.2, 1271-72=73-74.

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**ORIGIN
URBANIZATION
DECLINE**

INSTITUTIONALIZATION, KEY TO RAPID RISE OF INDUS CIVILIZATION

Rafi U. Samad

SUMMARY

Unlike other Civilizations, the Indus Civilization rose from a relatively immature phase of development to the level of fully integrated urban society in a very short space of time. After a certain level of urbanization had been achieved at Moenjodaro within a space of one or two generations, the Civilization rapidly spread far and wide covering an area of more than one million square kilometers. This extraordinary phenomenon could only occur through a combination of some extraordinary event and establishment of a well-coordinated network of basic institutions in the early phases of development. The extraordinary event was the massive destruction of earlier settlements located in the immediate vicinity of Moenjodaro by floods and the decision taken by the clans affected by these floods to build a new city at a safe location on artificially raised mounds. Archaeological investigations make it abundantly clear that Moenjodaro emerged as a fully planned city. During the process of planning of the city, the segregation of different activities and their handling by different departments led to the creation of basic institutions. The momentum generated during the process of planning and construction of a new city led to the creation of more complex institutions. These institutions were shaped by the needs of a newly emerging urban society. The pressures of this newly emerging society created a well-integrated institutional framework for the governance of the State.

The picture of the Indus Civilization, which has emerged through extensive archaeological investigations, provides a lot of information of large urban settlements and a technologically oriented thriving economy. Through analysis of the evidence provided by the archaeologists, the paper attempts to show that the basic strength of Indus Society lay in the creation of viable institutions. These institutions created by the Indus people 5000 years ago were based on concepts, which have striking similarities with the concepts on which modern state function.

As against the slow and cumbersome natural process of development of institutions for State governance in ancient societies, the institution building in the early phases of the Indus Civilization was a rapid exercise. This rapid transformation from a disparate format of a non-urban society to a highly institutionalized organization for the governance of a complex urban society was brought about through a unique event. The spirit of determination, cooperation and cohesiveness was generated through the process of building of a new city on artificial mounds after the total destruction of the pre-Indus settlement at Moenjodaro by floods. The key elements emerging out of the successful tackling of this crisis situation were the creation of a powerful ruling class with the

authority and capability of taking quick decisions and enforcing these decisions effectively. The ruling class comprised of natural leaders of the different clans inhabiting this region, and thus enjoyed the whole-hearted support of all the communities. The initial years after the construction of the new city of Moenjodaro were the most momentous. A lot of dynamism was shown in all the fields of activity. A very noticeable feature of the newly established regime was their extraordinary ability to plan. There was extraordinary depth and width in their planning. They were quick to realize the importance of institutionalization of different state functions and professionalization in all spheres of activity. They realized the importance of an effective system of controls and of checks and balances. Through this uncanny ability and the extraordinary dynamism generated during the process of building the new city, the new regime was able to achieve a mega-jump from the relatively disorganized and non-focused pre-Indus society to a highly efficient, motivated and focused urban society. The solid foundations for one of the greatest and widespread ancient civilizations were laid within the first few years of establishment of the basic facilities in the new city. In order to form an idea of the extent and scope of institutions developed by the Indus regime, we briefly recapitulate the basic facts relating to the Indus civilization:

The Indus civilization was spread over an area of more than one million square kilometers. Archaeological investigations have revealed the existence of more than 1500 settlements belonging to this civilization. These settlements were located in clusters, with each cluster separated from other clusters by distances of hundreds of kilometers. Each cluster included at least one city, several towns and hundreds of other smaller settlements. A very substantial segment of the total population of the Indus Civilization lived in cities and towns, where, by ancient standards, they enjoyed a fairly high standard of living. The cities were well planned and laid out and were provided with excellent roads, drainage, sewerage and other public facilities. The houses in the cities were constructed with kiln baked bricks and contained several rooms, including those used as kitchen, toilets, bathrooms. Earthenware components were used in the system for drainage and sewerage disposal, grills were provided in windows, and the doors were generally made of seasoned wood. The people made extensive use of pottery of various shapes and sizes; their food was rich in proteins and included cereals, meat, legumes dairy products and fish; they made extensive use of ornaments, cosmetics, toys and different varieties of clothing, including cotton textiles. These needs of the population were catered for by a very large number of industries, producing a large variety of goods. The industrial goods included several mass produced items for the people at large as well as luxury items for the more affluent classes. The raw materials required for these industries were supplied through multiple sources located within the State as well as in the surrounding regions. Some of the industrial goods were also exported to countries in the Persian Gulf and Mesopotamia.

For the type of society described above, an extensive network of institutions was required with well-coordinated horizontal and vertical linkages. The type of construction, the nature of the facilities provided at and the quantity and types of artifacts recovered from Moenjodaro indicates that Moenjodaro was the State capital. The archaeological investigations at this site provide an indication of the part played by the regime based at Moenjodaro in administration of the territories belonging to the Indus Civilization. From a knowledge of the work handled at the State level, it becomes clear that specialized departments existed at the center for activities such as town-planning, construction and maintenance of civic facilities, industries, food and agriculture, trade and commerce and revenue collection. The spread of the Civilization over such a vast area and the location of settlements in clusters with long distances separating different clusters indicate a decentralized form of administration in which Regional Capitals played a very important part. The concentration of regional administrative, economic and cultural activities in four or five major cities indicates the presence of a strong local administrative set-up at the city level.

ADMINISTRATIVE FRAMEWORK

As indicated earlier, all evidence points to Moenjodaro being the principal metropolis of the Indus State. Moenjodaro also served as the Regional Capital of the southern Region, which probably included the present day provinces of Sindh and Baluchistan. The southeastern regions of Cutch, Kathiawar and Gujarat were probably also connected through Amri with the Southern Regional Capital. The second most important city in the Indus civilization was Harappa, which probably served as the Regional Capital for the entire northern region. This northern region included Cholistan, Haryana and Rajasthan, besides the region in the immediate vicinity of Harappa. The available archaeological information indicates that Harappa was developed by the Central Indus Regime on the lines of Moenjodaro. The regime maintained a strong physical presence at Harappa and a lot of town-planners, engineers, craftsmen and key administrative personnel moved from Moenjodaro to develop the city and govern the northern territories, while maintaining the required liaison with the State Capital. The two regional Capitals of Moenjodaro and Harappa established representative institutions in all the major cities, which brought about a rapid integration of all the distant regions into the culture and economy of the Indus State.

While integration was achieved of all the regions in almost all the areas, the area particularly focussed by the Indus regime for interaction between the different regions was trade and Commerce. The Regime gave considerable importance to the development of a proper infrastructure to facilitate and promote business activities. The Indus planners developed the vision of a broad-based economy, which was to be activated and sustained through participation of every segment of the society. This unique concept was promoted

through creation of a number of dynamic institutions and rationalization measures devised by the regime.

ESTABLISHMENT OF DISTANT TRADING STATIONS

One of the strategies developed by the Indus Regime was to eliminate dependence of one particular source or region for the supply of raw materials required by the industries and the population at large. With this idea the regime made considerable efforts to locate different sources for the supply of these materials. Another strategy was to develop new markets for the products manufactured by the industries located in different regions. Keeping in view these major strategic initiatives the regime developed at least two distant trading stations. One of these trading stations was established at Shortugai on the banks of the Amu Darya, in northern Afghanistan, with the prime objective of tapping the rich mineral resources of Badakshan and central Asia. The other distant trading station was established at Ra's al Hadd in Oman peninsula to facilitate trade with the Persian Gulf and Mesopotamian regions.

FOCUS ON MARITIME TRADE

Prior to emergence of the Indus civilization most of the trade was carried out through overland means of transport. Due to long periods of time involved in communicating through overland trade routes, this was a major limitation on the volume of trade. The Indus regime took a major decision to make optimum use of waterways for inland trade and developed coastal stations for faster trade operations through sea-going vessels with the Persian Gulf and Mesopotamian region. This very decisive move was a major factor in the emergence of the Indus Civilization due to its impact on the region economy.

CREATION OF INDUSTRIAL ESTATE (VILLAGES)

This very modern concept developed by the Indus planners gives an idea of the extraordinary insight into factors relating to industrial productivity. Hundreds of Industrial Villages were developed in each region to produce a variety of industrial goods. Particular emphasis was laid at these villages on providing a suitable physical infrastructure, upgrading of technical skills and housing for the skilled craftsmen. These villages were connected to relevant trade organizations in the cities to ensure regular supply of raw materials and flow of items produced to national and international markets.

ENFORCEMENT OF RELIABLE SYSTEMS OF WEIGHTS AND MEASURES

The Indus regime developed a well-coordinated system of standard weights and measures. Based on very modern concepts of standardization and credibility an elaborate system was devised and implemented through a number of institutionalized measures. Appropriate sets of weights were standardized keeping in view all possible applications.

The manufacture of weights was restricted and was carried out in a limited number of carefully selected workshops, where the accuracy of the weights was strictly controlled by inspectors appointed by the regime. A number of measures were taken to prevent proliferation including designing of weights in certain standardized shapes out of specific materials. Due to these measures the system of weights was universally accepted and strictly enforced in all regions of the Indus Civilization. This system of weights was also accepted and employed in distant regions, not only for transactions involving the Indus State but also generally as is evident from the weights recovered through archaeological excavations in Oman, UAE and Bahrain and Mesopotamia. The thoroughness with which the Indus regime dealt with this issue of great significance in trade at all levels, domestic, department. The organization of the various Departments was such that they could respond favorably to these challenges. The Agriculture Department, through improvements in techniques and increase in cultivated areas was able to enhance food production to cater to the needs of increased population. The increase in population as well as growing stratification in the Indus Society, not only created demands for increased production of craft items; it also created demands for diversified range of products to suit the tastes, status and purchasing power of different sections of the society. The organization of the Industries Department was such as to fully cater to these demands. Other departments faced similar challenges also, and each of these Departments was properly organized to meet these challenges.

INQUEST OF ORIGINS OF THE INDUS VALLEY CIVILIZATION

Fazal Dad Kakar

Much has been written on various aspects of the Indus civilization, since its discovery and recognition at the site of Harappa and Mohenjo-daro. But the origin and formative stages of this highly developed; fully urbanized and extensive civilization of South Asia is still shrouded in mystery. Therefore, much remains to be accomplished to enhance our understanding of Indus civilization, in relation to its origin, growth and also its decline.

The picture of the Indus civilization, revealed to us through the dryer type of archaeological evidence, is that cities were built on a regular grid plan of straight streets and the chief thoroughfares ran at right angles to them. A drainage system embraced all parts of the cities. Almost all houses were constructed with burnt bricks. Houses were laid out around an inner courtyard; bathroom and toilet were connected to the public drains. These cities had fortified citadels on artificial mound, constructed of mud, mud bricks and burnt bricks. The archaeological evidence indicates that the Indus civilization relied on agriculture, as in the other two river valleys, of Egypt and Mesopotamia. The foundations of Indus prosperity were agriculture based on irrigation and fertility maintained by silt-bearing flood. Farmers living in villages clustered around the cities cultivated mostly wheat and barley of six-row kind and a sub species of it, vegetables, fruit and sesame as well as mustard probably for oil. Besides this cotton was grown (of *Gossypium* species) and extensively spun and woven for garments. Animals included sheep, humped and humpless cattle, buffalo and pigs, dog, camel, horses and elephants, as the bones and engravings point to the domestication of these animals from local wild species. Presumably, a very large part of every farmer's crop had to be paid and handed over to the public granaries. Craftsman produced goods for both home and trade. Potters were relatively far more competent, compared to the other objects craftsman of the greater Indus valley, using the wheel to turn out quite pleasing and standardized shapes of red ware, often most attractively painted metallurgy seems less inspired, however terracotta and stone figurines display the sculptor's remarkable art. In short, such regulation of society, possessing sufficient economic wealth to mobilize labour and to support full-time craftsman, with resources to engage in long distance trade, besides highly developed socio-political and religious institutions can reflect an authoritarian government and the uniformity of planning in both street layout and drainage system public building etc, over so wide a territory must imply a unified state.

Of all the uncertainties concerning the Indus civilization, the most damaging is its origins or genesis. As the diffusionists argue that the idea of civilization arrived from Mesopotamia and facilitated the transformation of the earlier village cultures (towns) into full scale cities, because of the fact that Sumer and Egypt had long ago emerged into a



civilized way of living at the time the Indus people built their cities of Harappa and Moenjo Daro, in the greater Indus valley and later other towns of Kalibangan, Lothal and Rangpur etc. Moreover, in Mesopotamia and Egypt, the mature development of early (cultures) peasant communities, which were direct evolution from the earlier cultures, after the initial stages of animal domestication and plant cultivation, had provided a basis upon which literate civilization was built, where urbanization had taken place earlier than in the Indus valley.

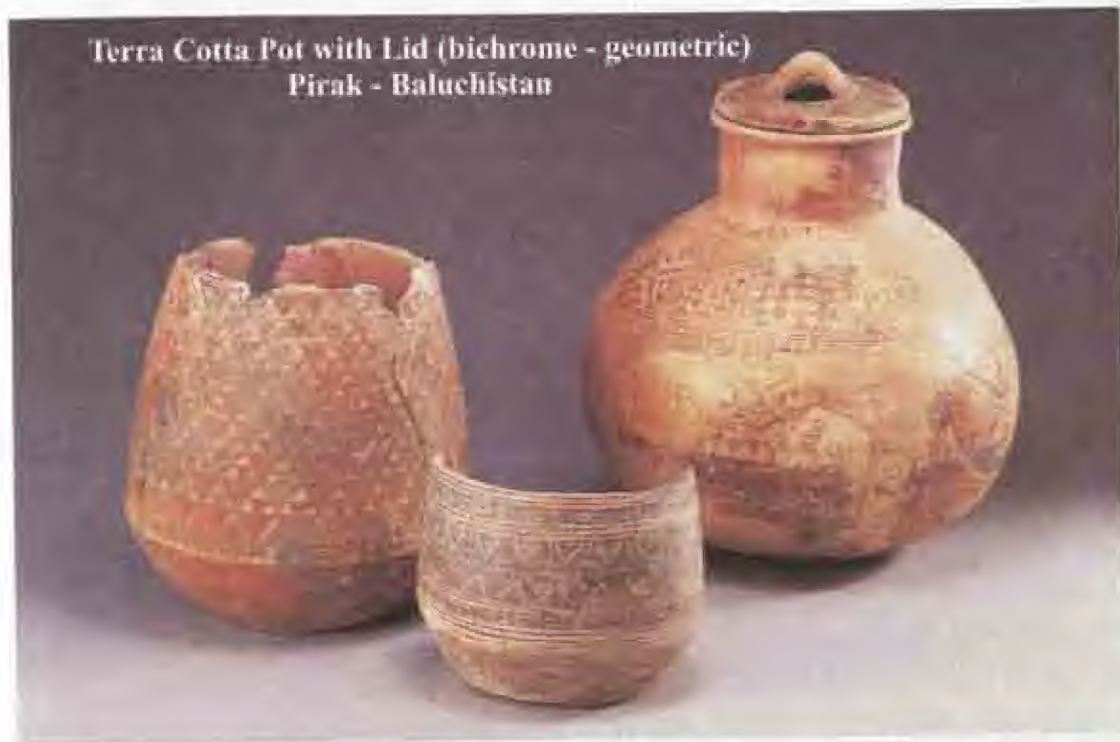
In the case of Indus valley civilization, so far as we have been able to discover it, appears suddenly and fully formed in the greater Indus valley, after 2600 B.C. For this reason it is necessary to emphasis here in the light of some new information relevant to the fundamental question of early developmental stages of the Harappan culture, and its ultimate growth into urbanization, with brief accounts of cultural environment which existed in the greater Indus valley and its north-western high lands. Well before the emergence of full-fledged Indus civilization in the greater Indus valley, early farming communities were already established in the highland regions northwest of the Indus valley, namely the present Baluchistan plateau and the mountains areas of the NWF Province. In Baluchistan, during the 8th millennium B.C. (As the recent archaeological survey of the author recorded) there were at least seven sites, including, Mehrgarh and

Killi Gul Mohammed, which were occupied by the Neolithic people. Amongst these Neolithic sites, Mehrgarh and Killi Gul Mohammed are systematically excavated. It is here, west of the Indus, where great steps forward, which enabled man in the South Asia, to break through the barrier between barbarism and civilization, occurred with the onset of the stone using farming villages. It is therefore, reasonable that a re-evaluation is necessary in light of new evidences, of some of the earlier theories that have come to from about the origins, of the Indus civilization.

With the discovery of Mehrgarh in Baluchistan, and its excavations by the French Archaeological Mission in Pakistan, brought to light a continuous sequence of occupation, right from the 8th millennium B.C., to the middle of the third millennium B.C. though is the only site, which has revealed a continuous sequence of cultures in Baluchistan. The first phase at Mehrgarh of Neolithic culture is represented by more than 9 meters of deposit and termed as a-ceramic Neolithic, yielded mud-bricks structures, multi-room rectangular units, polish stones axes, bones tools, retouched flint blades, microlithis, fragments of stone bowls, pestles, grinding stone, shell beads and some turquoise and lapis beads. This phase at Mehrgarh has yielded a large number of impressions of grain and straw of cultivated plants in the mud-brick and debris. These imprints include wheat, emmer and bread wheat. Besides, this phase also yielded charred seeds of Jujube. At Mehrgarh, this phase has produced sufficient information for the domestication of animals, though wild animals predominate in the lower level of the phase, however the upper level produced the remains of domesticated animals, such as cattle, goats and sheep. On the available evidence, from Mehrgarh and some other sites of the highland, though not scientifically excavated, prove that the beginning of the farming villages in the highland and proper Indus valley do not owed to stimuli from outside; but have made independent moves towards incipient agriculture and animal domestication. Naturally the fully-fledged Neolithic farming villages of the highland, in this part of the world did not spring into existence in few generations. They were the result of process of evolution from the Mesolithic stage, lasting in the highland from about at least 18000 B.C to 10000 B.C. (so far known only from Magdalenian paintings and engraving) by the later date, as shows the recent Archaeological survey (not yet published) of the author, permanent settlements of early farming communities well established in the highland west of the Indus valley, as indicate the presence of quern, founders, grinders etc found at various sites of the ceramic Neolithic / Chalcolithic period of the highland. Mostly these sites have been illegally excavated and plundered, in the recent past, probably in search of treasure and artifacts. At some of these sites one can even study the vertical stratigraphy of the site.

While examining the earlier farming communities (villages) in light of author's recent survey, it appears that the geographical position of the highland, west of the Indus,

**Terra Cotta Pot with Lid (bichrome - geometric)
Pirak - Baluchistan**



rendered it more or less a single culture province in antiquity. Here many villages established in the Neolithic period such as Mehrgarh, Killi Gul Mohammed, Rana Ghundai, Ismailzai, Musazai, Anjira, Periano Ghundai, Gumala, Sheri Khan Taraki etc and continued to flourish right through the Chalcolithic and some of them well into the Bronze Age. Most of the above mentioned sites have not been scientifically excavated, but what ever information/documentation we have gathered in the last two decades, and what we appear to have, over a relatively large areas of the highland, west of the Indus, is the independent beginning of simple agricultural economies based on herding and grain-growing. The subsequent mature development of these early farming communities of the highland has already been traced through excavations at some sites mentioned above. Our knowledge from these works and the recent work at the sites of Mari Qalat, Shahi Tump, Noushero, and Harrapa further augmented about the early phase of Indus civilization.

These development of the early farming communities of the highland are well documented when these succeeds the late Neolithic stage into Chalcolithic, at Mehrgarh (III), Anjira (II), Killi Gul Mohammed (III), Rana Ghundai (II) Gumala, Rehman Deheri, etc. in beginning of the middle of fifth millennium (all dates used are not absolute but relative), when man learnt metal technology in this part of the world. These sites of

chalcolithic horizon yielded several crucibles with traces of molten metal and rusted copper objects, along with such as beads of stone, lapis lazuli, turquoise, terracotta and carnelian. Amongst all the material culture, it seems that the painted pottery gained prominence, decorated with geometric and semi-naturalistic motifs, including rows of birds, goats or caprids, rosettes, triangles, chequer pattern etc, showing that man in this part of the world, had leisure for other pursuits than merely appeasing his physical hunger. The whole character of chalcolithic Mehrgarh, (As a index site) and some other sites of the highland reflects not only the achieved prosperity in material culture, but also continuity in the ceramic tradition. Slowly and gradually, the sites in the highland entered in the so-called advanced chalcolithic phase, probably around 4000-3800 B.C., evidenced at a number of sites, such as Periano-Ghundai, Mughal Ghundai, Ismailzai, Musazai in the Zhob valley and Rana-Ghundai, Chinjau, Sur-Jangal, Kibzai Zora, Spara Ghundai and Mughal Qila in Loralai valley of northern Baluchistan. As far as central Baluchistan is concerned, this phase has been evidenced at, Killi Gul Mohammed, Shiek Manda, Kechi Beg, Damb Saddat, Faiz Mohammed and Karez in Quetta valley and at Anjira, Siab Bamb, Siabhozy of Khuzdar valley including those of Mekran region, such as Miri Qalat and Shahi Tump in southern Baluchistan. This phase of advanced Chalcolithic has also been witnessed at Shri Khan Taraki of Bannu Basin and Gumla, Rehman Dheri, of Gomal plain in the N.W.F Province.

It may however be noted here, about the sites of highland, that only some sites are scientifically excavated. Therefore, it is difficult to indicate precise dates, stratigraphical equation of each period and phase at a particular site. As highland is a vast area, west of the Indus, it is possible that for instance advance Chalcolithic phase, is noticed that it appears at sites of Northern Baluchistan slightly earlier compared to those of southern Baluchistan, and the sites located in NWF Province, with divergent variant of the basic pattern. Due to this fact regionalism becomes distinguishable mainly in pottery styles and designs. Which of course need not indicate any thing more than local variation of craftsmanship, and cannot be taken to imply any cultural separation, or as affiliation between comparable or contrasting groups. However in this phase painted pottery tradition seems developed to a degree of brilliant competence at various sites of the highland. For example, the so-called Kot Dijian wares appeared first in the Zhob and Loralai valley of Northern Baluchistan, as attested by partial trial trenches at Periano-Ghundai, Mughal Ghundai, Rana Ghundai etc, along with some other wares, which later on appears at the sites of Quetta valley, and southern Baluchistan, and than lastly as at the sites of Amri, Kot Diji, in the greater Indus valley.

At the end of advanced Chalcolithic phase, structure of mud-bricks on stone foundation and without foundation houses have been reported at various sites of the highland, as attested by our key site of Mehrgarh stratigraphically. As regard the pottery three types

were prevalent, monochrome with geometric motifs painted in black, bichrom with geometric pattern, usually, black and red, and polychrome with red, black and white? Painted motifs include caprids, humped bull, loops and tassel. The animal motifs seems gradually turned into zigzags and horned friezes which diffused all over the sites of the highlands.

Between the middle and end of the fourth millennium B.C., the sites of highland in Baluchistan and NWF Province, seems to enter the early phase of the Bronze Age, as also attested by Mehrgarh IV, Damb Saddat I-II, Rana Ghundai II-III, Anjira III-IV etc. During this phase of early Bronze Age, people seems moved from the Northern Baluchistan Sites, south ward to the Quetta valley, Khuzdar region at the sites of Anjira, Nal, Bala Kot, Nindowari, and it was in this area of southern Baluchistan that they spread down on to the alluvial plain of the greater Indus valley and settled at Kot Diji and Amri. These movements of people from northern Baluchistan were also towards the east, as attested by Gumla II-III, in the Gomal valley of the NWF Province, from where, presumably they shifted to Harappa, where their presence has been attested by two clearly stratified layers 26 and 26A, and by the recent excavations of the American team, headed by Richard Meadow. Due to these migrations from Northern Baluchistan, in this phase of the Bronze Age, villages seems grew and spread throughout the highland. The settlement of the Quetta valley appears to have been very extensive as a result of the influx of new comers, mostly at the sites of Damb Saddat, Kachi Beg, Said Bahlo and Ahmed Kanzai. Some people moved further interior in the valley and made a settlement at the site, which now called as Faiz Mohammad. The cultural material of the site shows its commencement around 3200-3000 B.C.

By the onset of early Bronze Age, on the sites of highland, the pastoralists of this region were already herding on horseback as remains of domesticated horses are found in the encampments at Rana-Ghundai and sur-Jangal sites of Northern Baluchistan, which indicates and represents a pastoral phase that preceded village life throughout the highland. The permanent villages of the highland were however not very large, but they were occupied long and continuously. The houses had small rectangular rooms and were commonly built of mud-bricks on a stone foundations. It is interesting to note that the burnt brick so characteristic of Indus architecture were occasionally used at the site of Periano-Ghundai, Mughal Ghundi, Badanzai, Musazai of the Zhob valley, and Dabar Kot in that plain of the Loralai valley. At this site Sir Aural Stien found a drain made of burnt bricks, in a trench, during his excavations of the site in 1927. It is further interesting to note that the author in 1985 found a buried embankment, made of baked lumps of earth 50 meter south of the site of Periano-Ghundai. A portion of this embankment about 200 yards were exposed due to seasonal torrents flood water cutting and erosion, which pass close by the site. The inhabitant of the site to protect it from flood of the said torrent

probably built this embankment. The author found a potsherd embedded in one of the burnt lumps of earth of the embankment. This potsherd was of the so-called reserve slip of Faire-servis. Which means these fired lumps were made for the embankment between 3800-3500 B.C. and certainly ancestral to invention of burnt brick making in this part of the world. Which later on became characteristic of Indus architecture.

During this phase of the early Bronze Age, monumental structures were built, like those of Mehrgarh VII, Damb Saddat III etc. Pottery production areas marked with a number of Kiln has been brought to light at Mehrgarh, VII, Periano-Ghundai etc, various type of wares, such as Kachi Beg white on dark-slip, polychrome, black on buff slip, Quetta ware Quetta wet, and Faiz Mohammad ware etc, were prevalent throughout at the sites of Baluchistan. The most noteworthy features of this phase of Bronze Age were the appearance of the so-called Faiz Mohammad Grey ware, at various sites of the highland. The shapes included deep open bowls and shallow plates, with geometrical and naturalistic designs. The Grey ware is not always of high artistic value, nor does it mark the beginning of a new epoch and perhaps the first example of the last invention of Bronze Age men in ceramics. This phase also corresponded to the mass production of plain standardized pots, goblets, brandy glasses, globular pots etc, as well as the wetware. The Zhob style of mother goddess figurine, male terracotta figurines, animal figurines of humped bull and with out humps, compartment seals, double spiral bronze pin, etc which indicate the climax of cultural development in the highland.

To get a better idea of the life of these village communities and prevailing culture of the highland, in the Bronze Age, we can look to the southern portion of the highland, where part of this prevailing culture people, who lived at the site of Kulli, Nindo-Wari, Bala-Kot and Nal, learnt to make one fine product of scented unguent which they put in stone Jars. This product was in such demand that the luxury trade carried it to the dressing table of a Sumarian queen. Considerable numbers of Jars have been found at various sites of Mesopotamia, including that found in the grave of Queen Shub-ad, in Royal cemetery of Ur, that is to say about the middle of the third millennium B.C.

We have one other element of the prevailing culture of Bronze Age, worth commenting on it at this point, is the prevalence of religious beliefs, which were to become recurrent throughout the village communities of the highland. These beliefs find their archaeological expression in figurines of women, and cattles, found at various sites of the highlands, and suggest their place was in the household shrine rather than any formal temple. These human and cattle figurines indicate that they were the subject of "Cult". This type of figurine occurred frequently at all sites of the highlands, we may infer without exaggeration that the worship of this divinity and bull, must have been widespread. This form of worship was to have a significant role in the daily life of

Bronze Age men, they were in-fact culturally and therefore presumably socially interrelated over this wide area of the highland, which pass later on through the Indus valley civilization, and still persist through all the vicissitudes of the South Asian religious affairs.

The last stage of Bronze Age through which the people of highland passed gradually to the greater Indus valley, to the Harappan stage seems to be round about 2700-2500 B.C. As this time, most of the sites in the highland from North to South started declining and deserted soon after each other. What these desertions of the sites signify is not quite clear, but they may well have involved the migrations of people from the highland towards the greater Indus valley. The mass migration from the highland is indicated by the fact that this migration of the people coincided with the emergence and extension of urban life in the greater Indus valley. The reason for these migrations probably were the result of progressive agriculture and stock breeding of hundreds of these villages of the highland, which were leading to a continuous increase in population. In this way population pressure must have given a stimulus. For solving the problem, they followed the track of their forerunner, who were already settled at Kot Diji, Amri and perhaps Moenjodaro in the fertile greater Indus valley, making a recognizable contribution to the culture that was to develop at the banks of the Indus. The arrival of these emigrants is documented, mostly at sites of Harappa, Kot Diji, Amri and Moenjodaro, in the greater Indus valley. At Harappa, during the excavations in 1946, considerable amount of ceramics fragments of non-Harappan culture were found from pre-defense levels and debris of the fortification wall, in the stratified layers numbered as 26 and 26A respectively. These pottery types were infact the Periano Jangal painted and Periano Reserve slip as termed by Walter A. Fair Servis, and by F.A. Khan, as the Kot Dijian ware, after the site of Kot Diji in Sindh. These pottery types are derived from the sites of Northern Baluchistan brought to Harappa, during the gradual waves of migration of the people in the early phase of Bronze Age. As the archaeological evidence indicate that these people first settled, when coming from Baluchistan, at the sites of Gumla, Rehman Dheri, Karam Shah and Lewan in the NWFP and then seems settled at Harappa, in Punjab. A similar migration took place, in the same period, South ward from the highland, to the Indus valley, and seems to settled at the site of Kot Diji and Amri, in Sindh. The excavations at these sites revealed abundance of pottery, besides other material culture, identical to that which was recurrent at village sites of the highland from the early phase of Bronze Age. Which, with passage of time evolved, with the technological advance and consolidation which marks the heyday of this mature Bronze Age culture, at a date which might be estimated about 2400 B.C. termed as Harappan culture at sites of Harappa and Moenjodaro, as Indus valley civilization. This civilization is alleged to have lasted till about 1700 B.C, and destroyed by the Indo-Aryan. However it may be pointed that we lack historical record and archaeological evidence about the invasion. Natural vagaries seem most plausible.

BANNU:

A MELTING POT FOR CULTURAL CHANGE IN THE PROTO HISTORIC PERIOD

Farid Khan, J. R. Knox and K.D. Thomas

INTRODUCTION

Bannu (fig.1) is ideally located for the scientific study of the dialogue between cultures in the protohistoric periods. It occupies a topographical basin surrounded by hills and mountains and lies astride some very important routes of communication (for trade, migration, nomadic pastoral transhumance, invasion, etc.) between the Iranian Plateau and Central Asia and the plains of the greater Indus region. The principal routes of contact are along the Kurram and Tochi river valleys, but there are numerous other torrents (such as the Khaisor and the Shaktu) that cut through the hills and mountains separating the Bannu plain from Afghanistan. Immediately to the south of Bannu there are numerous routes along torrents curring through the western hills to the Gomal plain. All these routes were intensively used during the Historic and historically recent periods and many Historic and protohistoric period sites are associated with them. Bannu is connected in the south to the Gomal plain by the pass, or Kotal, at Pezu and in the west to the Indus plains by the pass at the Darra Tang where the Kurram cuts through the hills and merges with the Indus (fig.2).

Because of its strategic location, Bannu is potentially open to a diverse range of cultural influences coming from the north and west, from the south and from the east. The objective of this paper is to examine the known cultural sequence in the Bannu and adjacent Gomal regions in the protohistoric periods in the light of possible external contacts and influences. The chronology of the various cultural phases, and of the main sites discussed, is given in Table 1.

Much of the data discussed here derives from the field surveys and excavations of the Bannu Archaeological Project, of which the authors are the founding co-directors Khan et al. 2000a). The Bannu Archaeological Project was established in 1985 as research collaboration between the Department of Archaeology, University of Peshawar (subsequently with the Pakistan Heritage Society), the British Museum and the Institute of Archaeology, University of London. The members of the Project have carried out field surveys in Bannu and have undertaken excavation at various important sites (see the references in the Bibliography, below) (fig.3).



Fig - 1

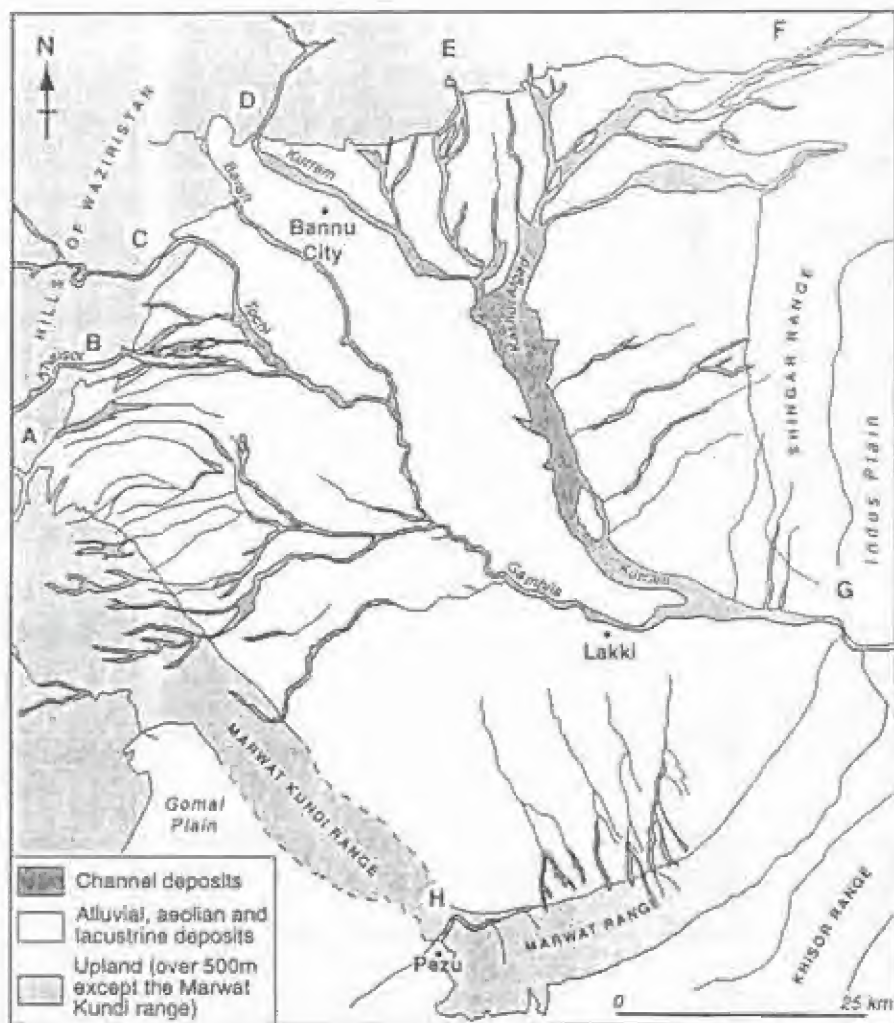


Fig - 2

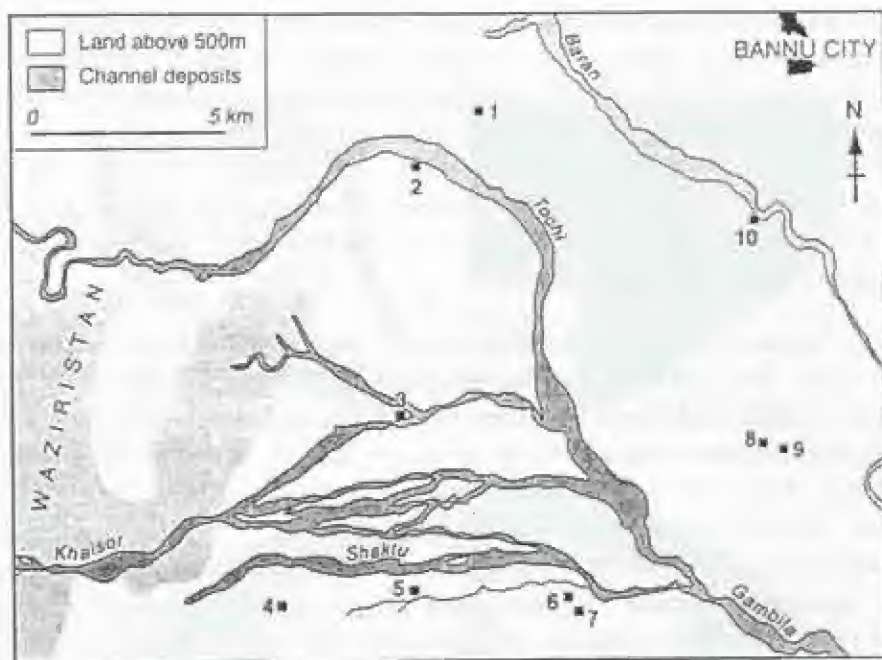


Fig - 3

THE SHERI KHAN TARAKAI CULTURAL PHASE

The Bannu Archaeological Project in 1985 first identified this Late Neolithic/Early Chalcolithic phase. It was immediately recognized as being a new and unique cultural phase in the archaeology of South Asia. The diverse assemblage of material cultural elements from the site includes a range of types which have enable us to establish both the unique characteristics of this culture as well as to identify some of its likely external contacts and influences.

The pottery is hand-built and occurs in two major categories of wares (although there are other minor types, which need not be considered here). "*A ware*" includes open bowls (many large in size), often heavily burnished in black on the outside and with a diverse range of internal designs also painted in black. Notable among these is zoomorphic representations, especially of mountain goats and cranes (fig.4,5). "*B ware*" is characterized by jars and carinated bowls having geometrical designs on the external lip and shoulder, below which the vessels are covered with applied slurry of clay containing ground up pottery fragments (fig.6, 7).

The terracotta figurines are exceptionally diverse, including both anthropomorphic and zoomorphic types. The anthropomorphic figurines are especially interesting, including a range of types hitherto unknown in South Asia. Some are standing female figures with fully recognizable human features while other are seated and often have very reduced stumpy legs(8,9). These ideas of reduction are carried to extremes in some figures, which are little more than 'bottle' shapes with applique breasts and pinched nose faces(fig.10). The vast majority of the anthropomorphic figurines appear to represent females, apart from two apparently male figures and one (possibly two) hermaphroditic figures(fig.9,10). All these figurines are made in the same red gritty pottery as the ceramics and have similar burnished surfaces as the interior surfaces of the "*A ware*" pottery. Many figurines also have black painted designs, including eyes, hair (often plaited), representations of clothing, and other patterns such as 'comb designs' that are less easy to interpret. A significant number of the figurines have distended abdomens, apparently indicative of pregnancy.

Also unique among the cultural materials from Sheri Khan Tarakai are the numerous perforated and semi-perforated terracotta cones and the 'handled' limestone weights, which are discussed further below.

Since the discovery of the site of Sheri Khan Tarakai, the Bannu Archaeological Project has found further sites of this culture type in Bannu. These are Barraī Khuarra I, Girdai and Ter Kala Dheri. Investigations outside Bannu, in the Gomal Plain, have located Sheri Khan Tarakai type-site at Jhandi Babar in D.I. Khan District (fig.11, 12). We have

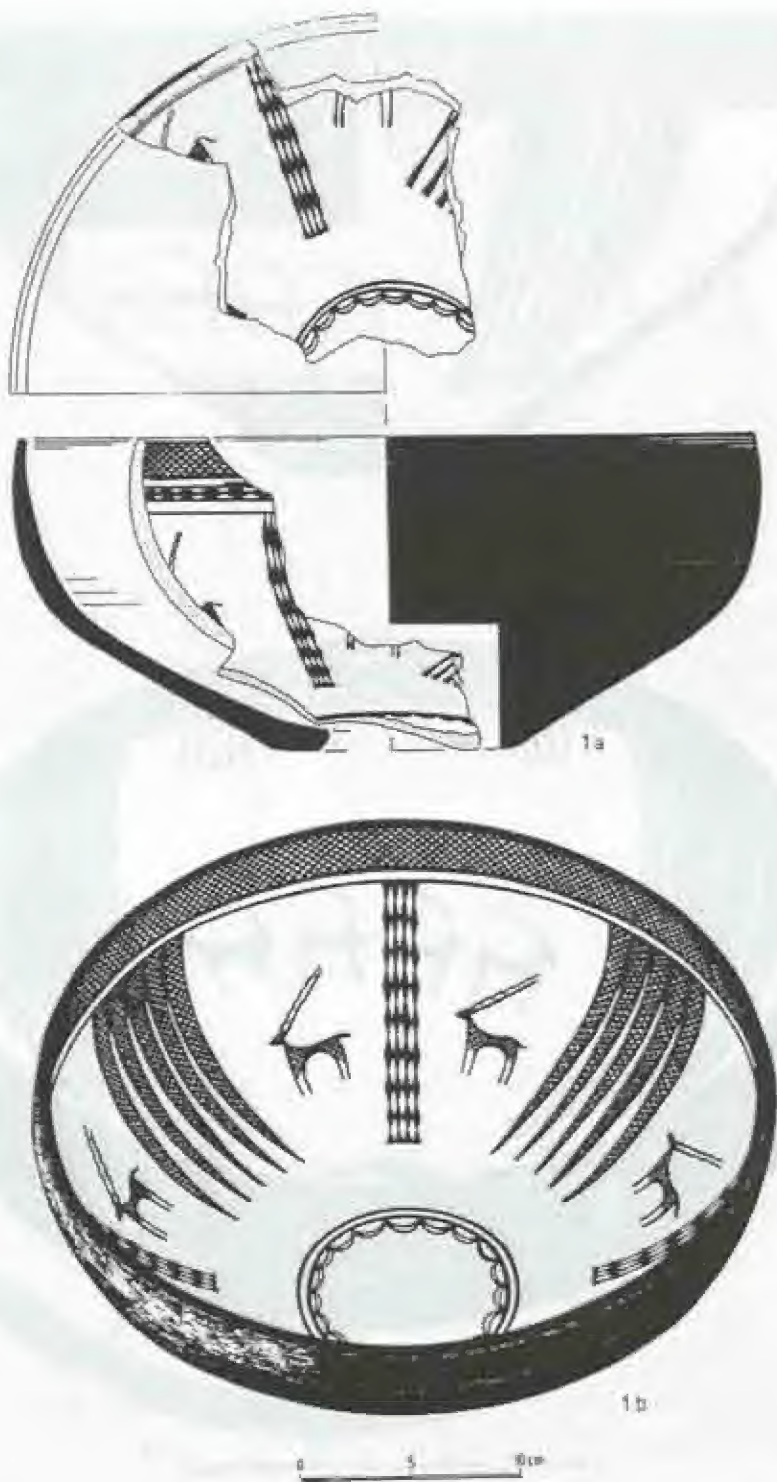
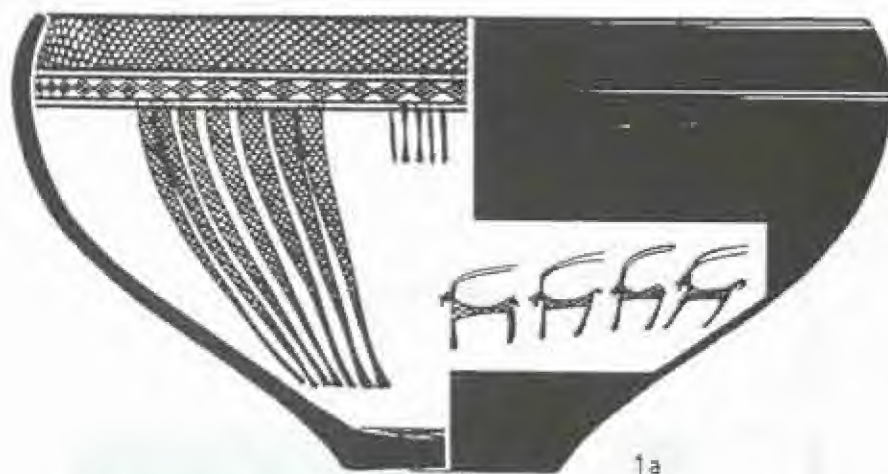


Fig - 4



1a



1b



Fig - 5

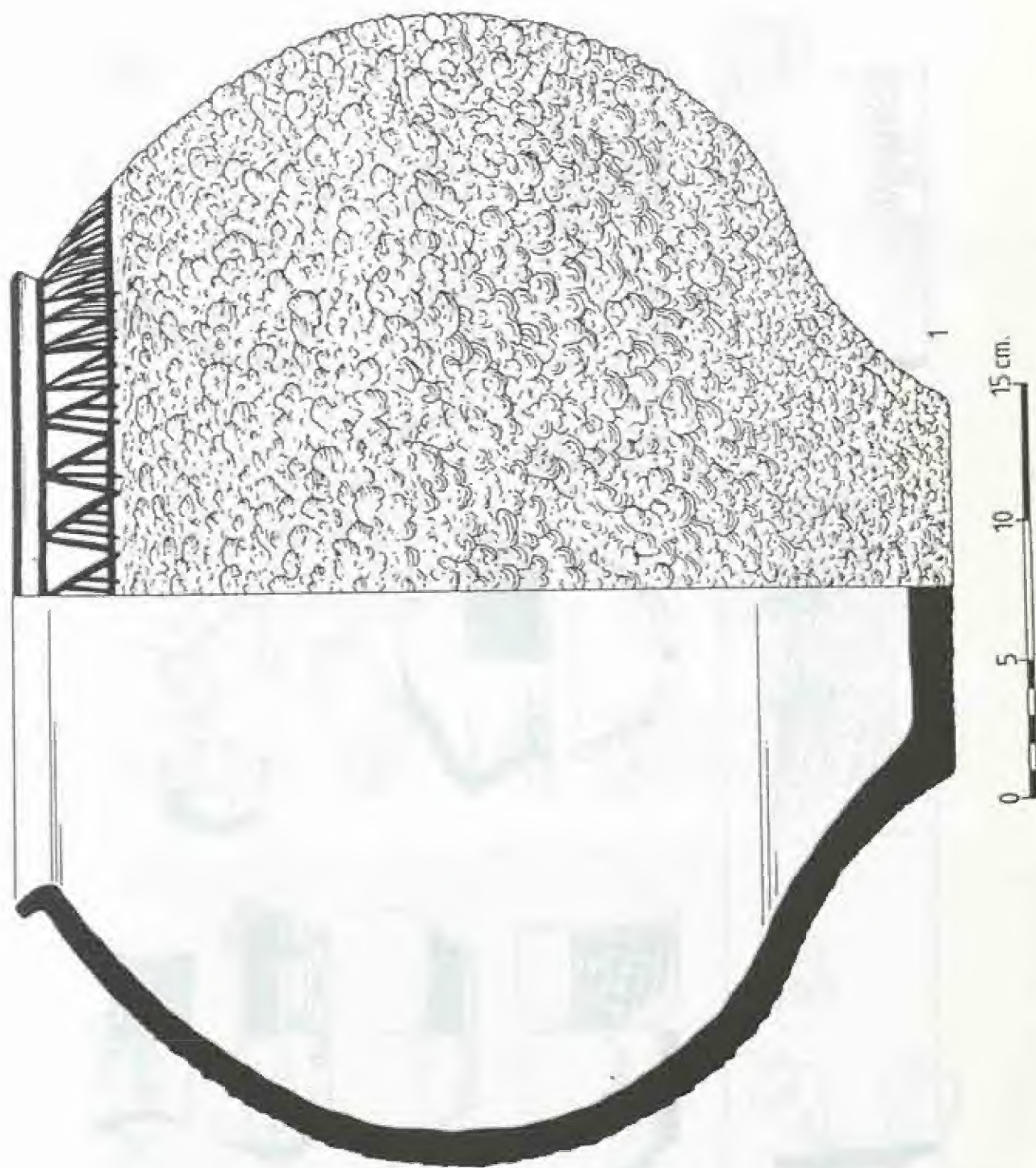
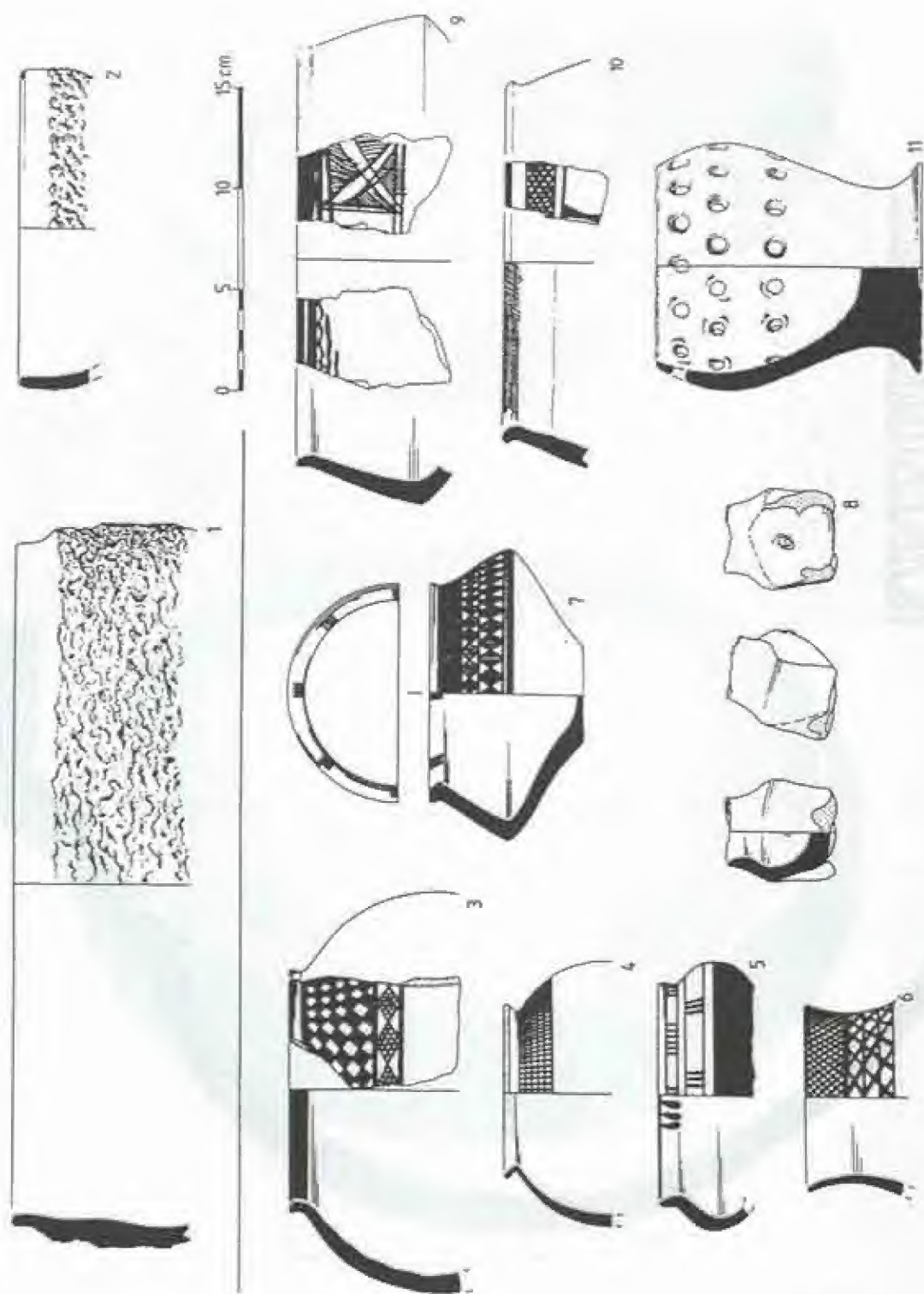


Fig - 6

Fig - 7



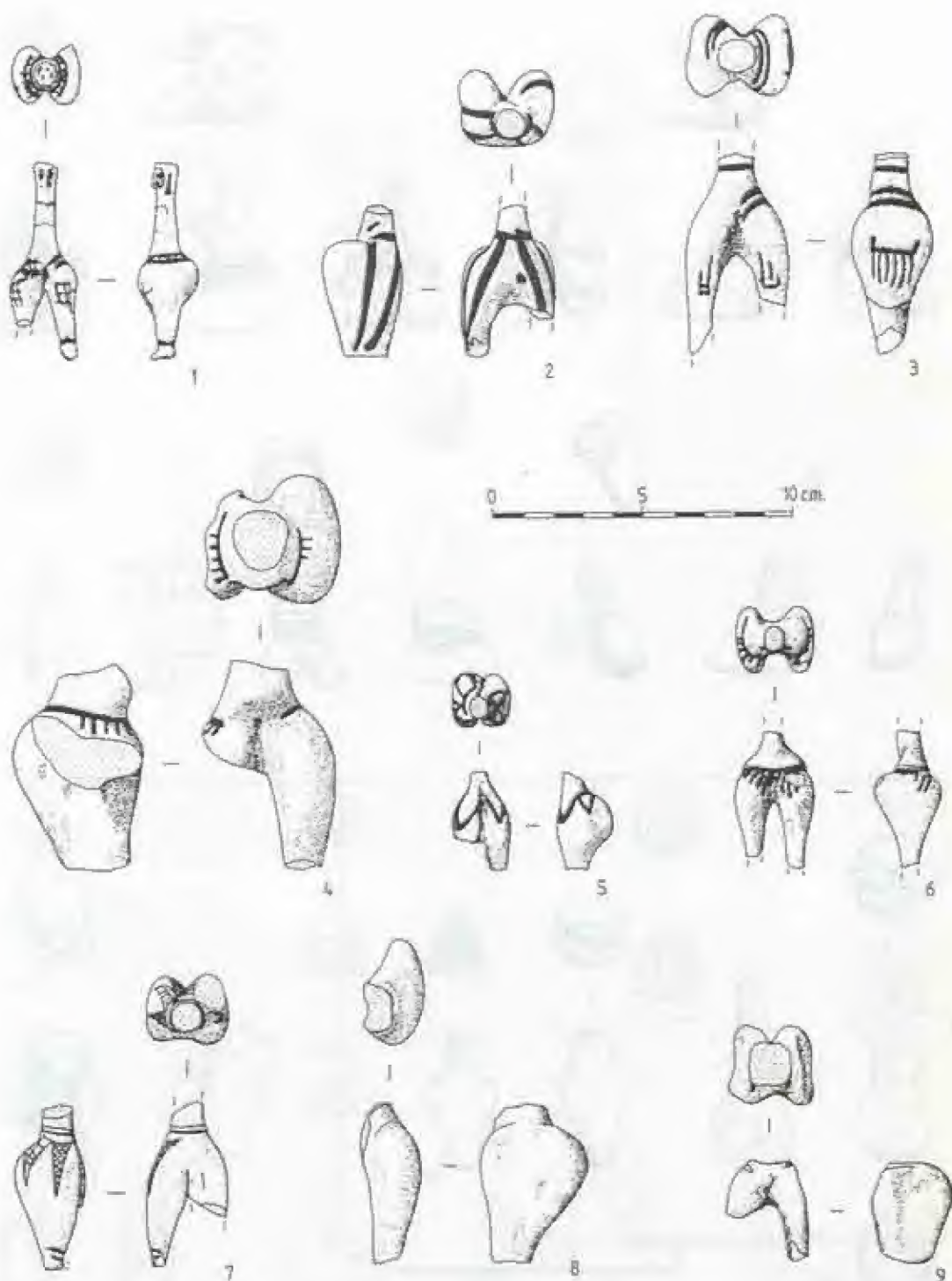


Fig - 8

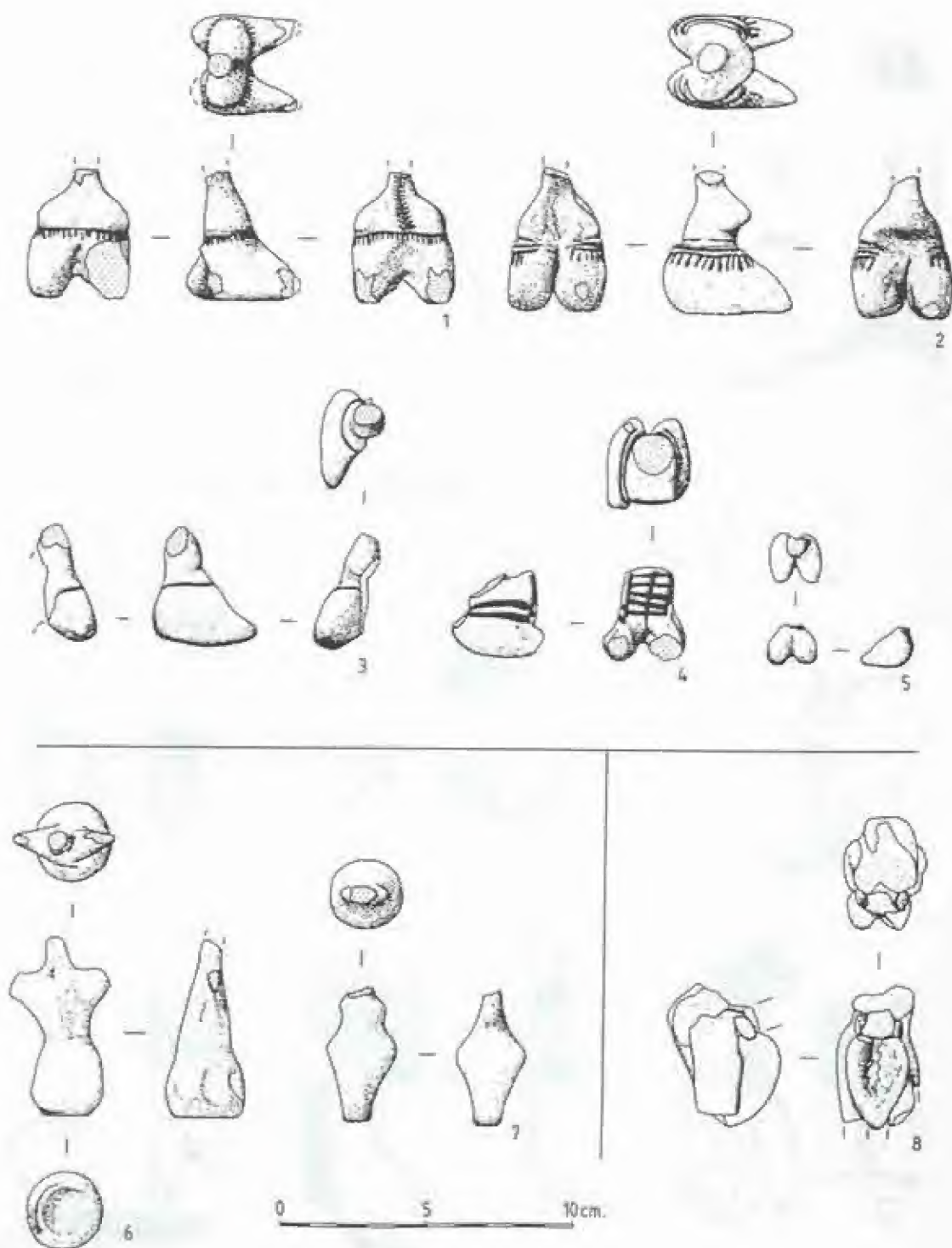


Fig - 9

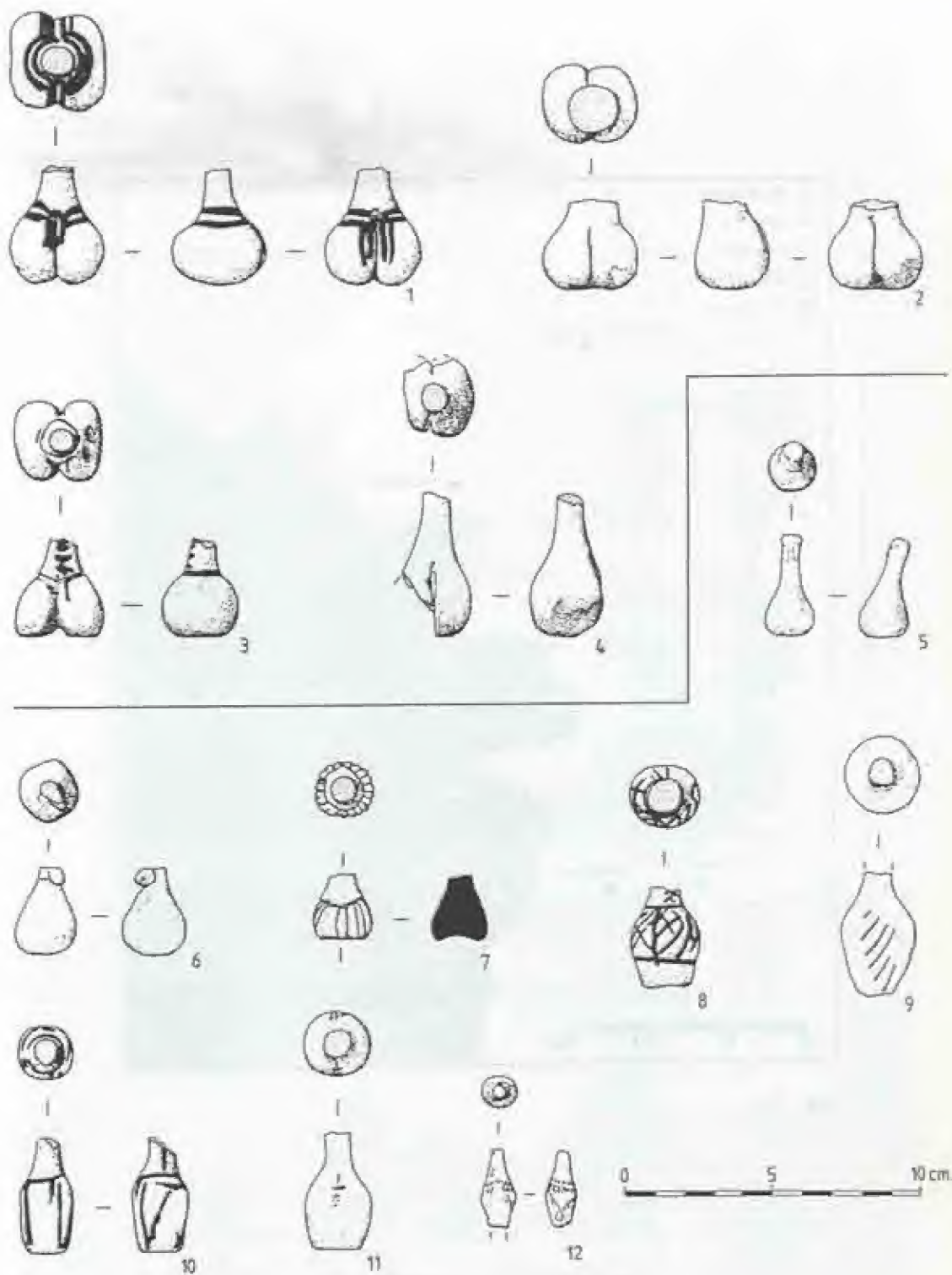


Fig - 10

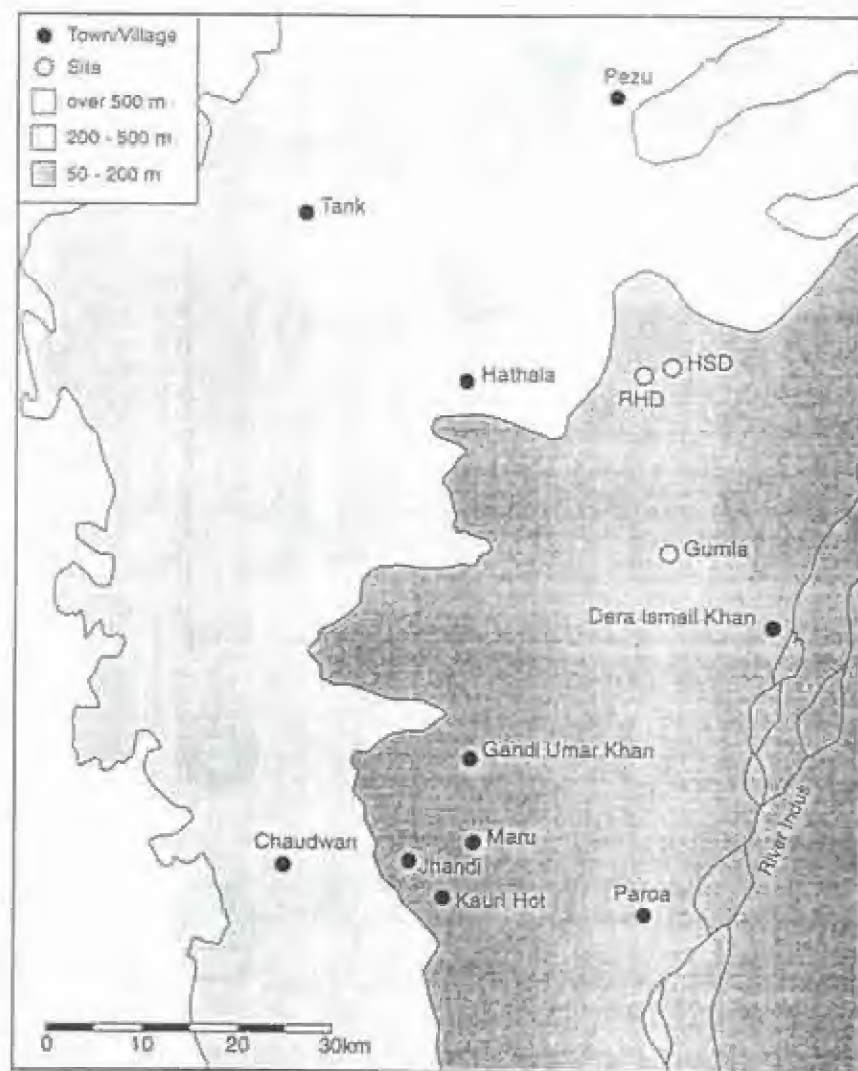


Fig - 11

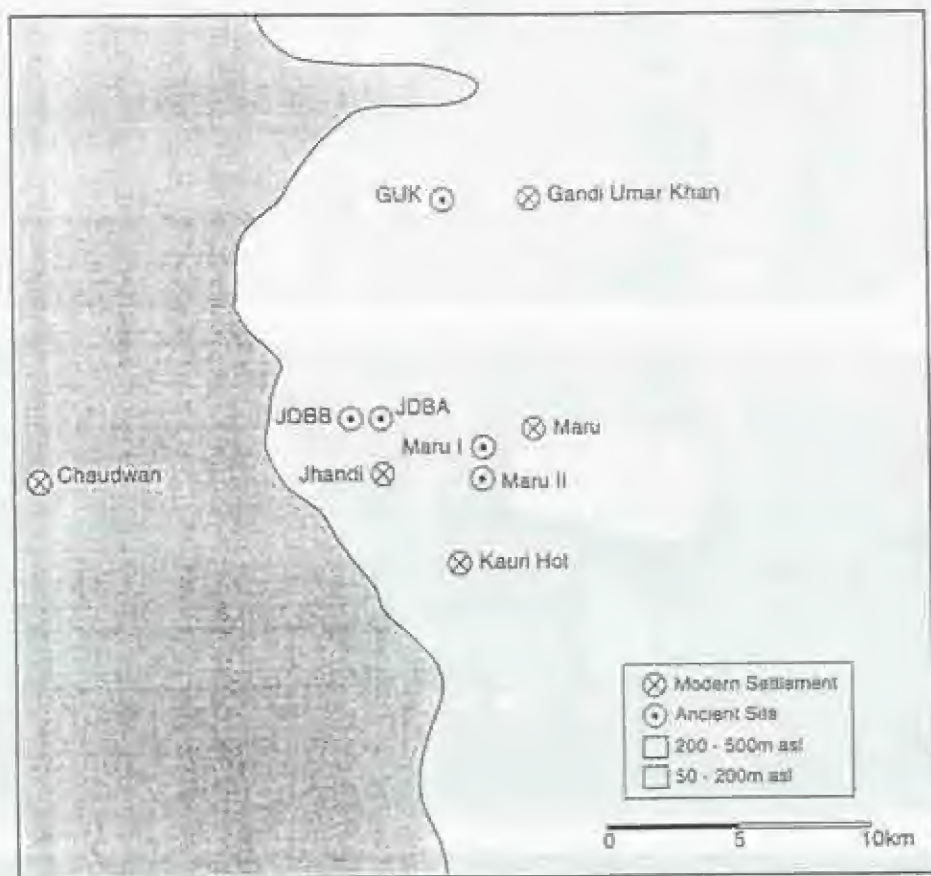


Fig - 12



PI-1



PI-2



PI-3

examined this site, and the material cultural remains found on its surface, and confirmed its close affinity to the sites in Bannu (Khan et al. 2000b) (Pl. 1,2,3,4,5,6,7).

THE CULTURAL AFFINITIES OF THE SHERI KHAN TARAKAI COMPLEX

The total assemblage of materials from Sheri Khan Tarakai constitutes a unique addition to the cultural history of South Asia, but there are various elements within it that point to external contacts and influences. Some components of the pottery assemblage have similarities with some of the forms found at Rana Ghundai and Periano Ghundai in northern Baluchistan, but no close similarities or associations can be identified with any sites in other regions. It has been suggested that the 'B ware' from Sheri Khan Tarakai is closely related, if not identical, to the so-called 'Hakra ware' of Cholistan. Although at first glance appealing, we do not believe that this association is tenable, on either chronological or cultural grounds. The chronology of the 'Hakra' sites has yet to be established by excavation and radiocarbon dating and there is as yet no reason to suppose that they are year as early as Sheri Khan Tarakai. Further, it has not been demonstrated that the technique of covering vessels with slurry of gritty clay has any deep cultural significance. It is simply a technique for producing vessels that can be used for the cool storage of water and perishable (probably food) items and variations of this technique can occur in a wide range of cultural contexts, including up to the present day.

The terracotta cones and handled weights provide much firmer ground upon which to establish the cultural affinities of the Sheri Khan Tarakai complex. We know of no close parallels for these classes of objects from sites in South Asia, but direct parallels exist at various sites on the Iranian plateau and in adjacent areas of Central Asia (Khan et al. 1988, 1992).

Finally, some of the attributes of the anthropomorphic figurines have strong resemblance to those found at the site of Ilginly Depe in Turkmenistan. Taken together, the evidence from the material culture of Sheri Khan Tarakai and related sites suggests contact with Iran and central Asia, probably via the mountain passes discussed above. Contacts with other areas to the northeast and to the south are indicated by finds of lapis lazuli (probably from Badakhshan, Afghanistan) and chunk shell (from the Arabian Sea coast), but the predominant cultural influences seem to come from the northwest.

THE TOCHI-GOMAL PHASE

First identified outside the Bannu region, at Gumla II and Rehman Dheri I, this culture phase has also been found at sites such as Lak Largai, Lewan, Islam Chowki and Ter Kala Dheri in Bannu and Jhand Babar in Dera Ismail Khan. It was on the basis of this geographical distribution of sites that we named the phase the 'Tochi-Gomal phase' (Khan et al. 2000c).

The ceramics of this phase are characterized by fine, wheel-thrown, pottery made from well-levigated clay. Thin lipped bowls, both carinated and simple, are especially characteristic, often having polychrome painted designs on their outer surfaces (Pl.8, 9,10). These designs are often highly complex and variable, including wavy lines, 'eye motifs', geometrical patterns, etc. Some pots also have representations of cranes, fish and other animals. The terracotta figurines are completely distinct from those of the Sheri Khan Tarakai phase. Particularly characteristic are the so-called 'swing legged' female figurines.

CULTURAL AFFINITIES OF THE TOCHI- GOMAL PHASE

Within Bannu there is an extremely interesting cultural relationship between the Sheri Khan Tarakai and Tochi-Gomal phases at the site of Tar Kala Dheri (Thomas et al. 1997). Here an intriguing 'transition' was found both between the pottery types and the terracotta figurines of the two phases, clearly indicating cultural connections between the latest phase of the Sheri Khan Tarakai episode and the Tochi-Gomal culture. This might reflect a cultural transition indigenous to the Bannu region, from where it might have spread to other areas. On the other hand, it might reflect the local enculturation of the Sheri Khan Tarakai culture into a fully formed Tochi-Gomal culture that had spread into Bannu from elsewhere. Clearly, there is room for various models intermediate between these extremes, but the data do not, at present, allow us to choose between any of them.

A cultural phase analogous to the Tochi-Gomal phase has been identified by the team currently working at Harappa, and termed by them the 'Ravi-Hakra phase', but subsequently revised to just the 'Ravi phase'. There are no clear antecedents for the Ravi phase in either the Punjab or in adjacent areas to the south and east. A western source is possible and the Bannu and Gomal areas must be considered as possible candidates, especially given their immediate proximity to the passes and their exposure to outside cultural influences. It is difficult to evaluate the cultural relationships between the Ravi and Tochi-Gomal phases, but their chronology appears to be similar. The pottery of the Ravi phase is, however, hand-built, in marked contrast to the fine wheel-thrown pottery of the Tochi-Gomal phase. It remains to be seen if there is a phase of hand-built pottery in the earlier part of the Tochi-Gomal phase, although the transition claimed between the hand-built Sheri Khan Tarakai pottery and the wheel-thrown Tochi-Gomal pottery at Ter

Kala Dheri would seem to make this unlikely. Further work needs to be done on the Tochi-Gomal phase in Bannu, especially to seek its earliest manifestation and the details of its relationship with the Sheri Khan Tarakai complex.

THE KOT DIJIAN PHASE

This cultural phase is extremely well known to scholars working on the proto history of South Asia and needs no detailed introduction here. Paradoxically, despite it being so well known and covering such a huge geographical area, the Kot Dijian period is poorly understood in its broader context and has been somewhat neglected by scholars. There can be little doubt that the Kot Dijian phase represents a major cultural, social and political milestone. The material culture of the Kot Dijian phase shows a remarkable degree of homogeneity over a huge geographical area, suggesting a high degree of social and political integration at that time (Pl.11.12). Sites such as Rehman Dheri, in the Gomal plain, suggest that some Kot Diji phase sites were both very large and highly organized. Possibly some were 'urban' or Proto-urban settlements (Pl.13). There is a great need for the Kot Diji phase to be investigated in detail as a phenomenon in its own right, rather than being minimized as the early Harappan.

CULTURAL AFFINITIES OF THE KOT DIJIAN PHASE

As noted above, many of the external influences effecting cultural change in the region appear to come from the northwest, through the numerous passes. It is possible; therefore, that the Kot Diji cultures might have similar origins. From the known radiocarbon chronology, there is little or no room for another cultural phase between the Tochi-Gomal/Ravi phase and the Kot Dijian phase, implying either that the latter evolved out of the former or that it came into the region from elsewhere. The so-called 'serpentine' figurines, characteristic of the Kot Dijian phase, are known from Altyn Depe in Southern Turkmenistan, yet again suggesting probable influences from the northwest. The alternative possibility that the Kot Dijian evolved out of the Tochi-Gomal/Ravi has yet to be evaluated and must be an important topic for future research.

As noted above, the Kot Dijian has often been viewed as the 'early Harappan', to the detriment of the objective study of this phase in its own right. While there can be little doubt that there is a close evolutionary relationship between the Kot Dijian and the Harappan, this remains to be clarified in detail. The results of our work in Bannu and the Gomal plain suggest that the relationship is not likely to be simply one of evolutionary replacement of one by the other.

THE HARRAPAN CULTURAL PHASE

From the perspective of Bannu there is nothing to say about this phase because, despite extensive field surveys, the Harappan phase has not yet been found. We strongly suspect

that it is not present. This is despite the presence of a significant number of Kot Dijian sites in the Bannu region. These do not appear to have 'evolved' into Harappan settlements, or to have 'attracted' Harappan settlement into the region from elsewhere. There are at least four Harappan sites in the Gomal plain (Khan et al. 2000d) and there appears to be no good reason why Harappan settlement could not have spread into Bannu from this immediately adjacent area, yet it appears not to have done so. The relationships between the Kot Dijian and Harappan culture phases are clearly complex and it is possible that the Bannu region remained an area with essentially Kot Dijian cultural affinities during some (or all) of the Harappan period. Again, further work is essential to clarify this apparent, but very interesting, anomaly.

CONCLUSION

The foregoing discussion has raised some important issues about the processes of culture change in the greater Indus region in the protohistoric periods, especially the problems of determining where such changes originated or from where major influences came. We are fully aware that we have made some speculative, and possibly contentious, suggestions on this subject, with which not everyone will agree. We believe that it is desirable to clarify the main issues and raise them in public debate, in order to develop ideas further. What has been suggested here is far from being the last word (we, at least, certainly intend to say more in the future!), but if our idea or speculations lead to new interpretations or approaches then we shall be more than satisfied.

Our own future research strategies will be focussed on addressing in more detail the questions that we have raised in this paper. We hope to have demonstrated that Bannu is a region within which significant cultural changes occurred in the past and that it might, indeed, be viewed as a melting pot from which new cultural associations.

TABLE 1

Cultural phases and chronology of sites of the (pre-Harappan) proto-historic periods in the Bannu region:

Cultural phase	Type site	Bannu sites	Date ranges
Pre-Harappan of Kot Dijian type	Kot Diji (Sindh)	Islam Chowki Tarakai Qila Tarakai Ghundai Lewan Seer Dheri	2900-2200 BC 2460-2040 BC None available (In process) None available
Tochi-Gomal phase-(Sensu Khan et al. 2000c)	Rehman-Dheri (Phase-I)	Islam Chowki Lak Largai Lewan Ter Kala Dheri	3050-2550BC 2885-2625 BC (In process) 2920-2620 BC
Early Chalcolithic /Late Neolithic	Sheri-Khan Tarakai	Sheri Khan Tarakai Barrai Khuarra I Ter Kala Dheri Girdai	4300-2760 BC None available 3110-2880 BC (In process)

- The calibrated date ranges given are summaries (oldest and youngest dates within the 95.4% confidence range) of radiocarbon determinations made on charred organic samples from various stratigraphic units on each site. Charcoal samples from Lewan and Girdai have been submitted for radiocarbon determination but the results are not yet available.

ACKNOWLEDGEMENTS

The team members of the Bannu Archaeological Project are grateful to the Ministry of Culture, Sports, Tourism and Youth Affairs for providing an opportunity to present the synthesis of our sixteen years work in Bannu. The team members are extremely thankful for the help, encouragement and constant cooperation received from the Department of Archaeology and Museums, Government of Pakistan.



Pl-4



Pl-5



Pl- 6





Pl-8



Pl-9



Pl-10



PI-11



PI-12



PI-13

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MOENJODARO AN URBAN PHENOMENON IN THE THIRD MILLENNIUM

Michael Jansen

As could be seen in the latest set of exhibitions of NHK, the Indus Civilization is one of the early in the World. Amongst these Civilization, besides the one along the Nile, the one along the twin river Euphrates and Tigris the early cultures of China have been, fully justified, included, though in the early time of the third millennium a writing could not be recorded there.

More recent studies carried out in an inter-disciplinary working group in Germany (Interdisziplinäre Arbeitsgruppe Stadtkurforschung) have clearly shown that each civilization has got it own and individual 'Pattern.' This regards not only the form of religion but also its constellation of 'energy potentials' as a kind of motor behind all action, represented e.g. in the individual power structure. Different elements of 'power in a civilization may be differentiated into sacral, profane and elite profane, represented e.g. by priest communities, citizens and feudal structures. In the Old Kingdom of Egypt the distribution of these elements differs extremely from that of the Early Dynastic Period in Mesopotamia and from the Indus Civilization. While for Egypt and Mesopotamia we have texts to study in addition to the archaeological remains, for the Indus Civilization we only can account on the archaeological remains with all problems of interpretation of data.

The interpretative problems of archaeological data can be seen even today after intensive recent excavations e.g. in Harapa but also in Dhaulavira or other sites. The cultural interpretation of the archaeological data still remains mostly unsatisfactory (see e.g. the contribution on Harappa in the National Geographic). It seems to be extremely difficult to interpret data out of a closed system, which in this case is the Harappan research itself as the data seem to be self-evident and self supportive within the interpretation structure.

First relational (comparative) studies with other (contemporary) systems seem to be very fruitful. A comparison of the architectural structures in relation to their socio-culture implication turns out to be quite successful. While up to recent Moenjodaro was more or less the most fruitful body of data of urban phenomena to be studied, new results e.g. from Dhaulavira seem to be promising. Unfortunately the research of Harappa did not essentially contribute to this part of research while it was extremely fruitful for other parts of archaeological studies.

Intercultural comparisons relating 'city' clearly show that 'urban infrastructure' as a social phenomenon was best developed in Mohenjo-daro, not only compared with other Indus cities but also compared with other cities such as Uruk in Mesopotamia or



Arial View of Stupa & Great Bath



Plan of the Citadel

contemporary cities in Egypt of which we hardly have records, not only because they were built of mud brick but also because they have hardly been excavated. 'Urban infrastructure' may here account for the lay out (regular street planning) but also and specially for the water supply and sewage (see Jansen, M. 1993). In addition it may account for what I call 'residential behavior', the way how residential space was designed and used. Here multi room lay out of house point towards a refined way of living, giving different functions of living individual house space. Multi room units are here contrasting 'simple' one or two room units in which many functions took place in one room. Against this theory the house pattern of different Harappan sites have to be compared with those of Moenjodaro to identify not only similarity or divergence but also social status. This study should be carried out diachronically as well as synchronically.

Taken into consideration that the three appearances of power, sacral, profane and profane elite are represented in each society, it would be exciting to try to identify further building with these power elements. We all know how painstaking this work is, if we look at the history of interpretation within the Indus Civilization starting in the twenties over Wheeler in the 50s as Chief ideologist and ending up in a 'gateway' of Harappa. But again, compared with Egypt and Mesopotamia, relational interpretation makes it very clear how strong the sacral component was in Egypt further strengthened by the profane elite component. God and king became one in the person of the Pharaoh, architecturally represented by their tombs, the Pyramids while the 'cities' hardly existed, at least not as a power component of the citizens themselves.

Different is the picture in Mesopotamia during the Early Dynastic Period with its city-states, remembering e.g. Uruk so well described in the Gilgamesh Epos. But also here the picture changes after 2350 BC, after the appearance of Sargon of Akkad and the first monumental architecture, the Ziggurat.

Coming back to Moenjodaro we see hundreds of houses in best quality and a city with an excellent urban infrastructure. Of course the 'citadel' (Wheeler's military terminology) definitely was the seat of an elite, profane or sacral, we even cannot say. But its form remains unique, is not reflected in any other Harappan site. No bath anywhere else, no 'granary' (if so) what remains is a highly diversified system: hardly any similarity of a monotonous system though propagated since Wheeler till today.

There were many attempts to prove the general Harappan urban pattern, citadel in the west, city in the east: Kalibangan may be, Surkotada questioned, Lothal speculative, Dholavira definitely not etc. But how is there the distribution of power? Where reside the priests, where the feudal lords, where the citizens? How are they represented architecturally?

Again we come to the conclusion that no direct answer can be given and that Moenjodaro covers most of this information, if any. Therefore, not only the studies of the past excavations in Moenjodaro have to be continued – and I am proud to finally announce the publication of the Site Atlas of Moenjodaro with much unpublished material – but also further research is needed here. There must be more excavations on this site.

My last point in this abstract regards the problem of conservation and excavation. When the UNESCO campaign was closed in 1997 the principles of conservation for the site had been worked out and laid down in a detailed conservation manual as well as in the final directions of the International Consultative Committee. We know today how to save Moenjodaro.

But it needs a scientific execution of the program and permanent maintenance, which lies in hands of the Government of Pakistan and which hopefully will be executed rather soon with further assistance of UNESCO and with international networking. Therefore, excavations can be and should be continued under the condition that the structures are immediately treated and protected according to UNESCO and ICOMOS standards. A large part of the questions to the big riddle of the Indus Civilization lie in Moenjodaro and we should try to answer them.

URBANISM IN THE INDUS VALLEY ENVIRONMENT AND SETTLEMENT OF THE BEAS RIVER.

**Rita P. Wright
Muhammad Afzal Khan
Joseph Schuldenrein**

In this paper, we report some preliminary results of a regional settlement survey of Harappan sites currently being conducted along the now dry bed of the Beas river. Its principal focus is on urban developments at Harappa, the rural settlements within its regional catchment and the dialogue that was established between urban and rural people in these first steps toward urbanism in South Asia. The project is the first in Indus studies in which an ongoing excavation at a major city is being conducted in conjunction with a regional investigation.

A basic assumption is that the continuity and disruptions at smaller, regional sites can provide insights into the nature of urban and rural dependencies. In that sense, the project builds on the more city-focused research at Harappa by integrating studies there with others in rural settings in order to establish a baseline understanding of the nature of these relations. The project also includes a geoarchaeological component designed to assess the degree to which environmental conditions, especially the stability or instability of its alluvial landscape, contributed to the onset and/or abandonment of settlements along the Beas and at Harappa. Our results will contribute to the knowledge base of Indus studies, the history of Pakistan and South Asia and in general terms to an understanding of patterns of urban growth in early societies and changing social and natural landscapes.

BEAS REGIONAL SETTLEMENT SURVEY

The settlements along the Beas were originally discovered by members of the Punjab Archaeological Survey, in a major undertaking initiated by the Department of Archaeology and Museums, Government of Pakistan, that was designed to document all archaeological sites and monuments throughout the Punjab. In the Punjab, twenty-three districts were explored and 1183 sites and monuments discovered that span a time period from the Palaeolithic to historic periods. Maps and other documentation of these sites are reported in Pakistan Archaeology No. 29. Of these 18 early Mature Harappan sites were located along the old bed of the Beas River near the ancient city of Harappa.

The presence of rural settlements near the city of Harappa was unexpected and provided an important opportunity to investigate the nature of urbanism in the Indus civilization. In previous discussions of Harappa, some archaeologists had claimed that it was strategically located at the frontier of the Indus civilization, positioned for access to trade and exotic natural resources from the north and west. Settlements of this type frequently

referred to as gateways, do not have sustaining, rural networks. In geographical terms, they are thought to have a primate distribution, in which urban growth is less related to rural production and local exchange systems than to redistribution and trade (Fentress 1993, Ratnagar 1993).

Studies of urbanism in antiquity have shown that the primate pattern is rare. The exception is the Dynastic sequence in Egypt, where a powerful state, appears to have coordinated activities from an imperial center. But elsewhere in both New and Old Worlds contexts, there was a mutual dependency between cities and outlying settlements that constituted its economic and political infrastructure. The groundbreaking research of Robert Mc. Adams in Mesopotamia, during periods contemporary with the Indus civilization, has shown that goods and services flowed between rural and urban places. At the same time that critical resources outside of cities were drawn into the city, others, such as craft products, were distributed to its countryside. As Adams has noted for Mesopotamia, early cities did not/could not exist without this sustaining network in a mutual dependency (a melting pot if you will) in which people became encompassed in an urban way of life.

The strategy employed by the Beas survey is designed to obtain evidence commensurate with the goals stated in the above. The research of the PAS provided a baseline of information but given its broader geographical goals did not focus specifically on the relationship of the Beas settlements to Harappa and urbanism. With the above goals in mind, our research methodology is designed to provide evidence for reconstructing landscape and site distribution, chronological and cultural sequences, and environmental conditions, as follows: -

Mapping Project involving landscape and site documentation. Landscape reconstruction using formats from Geographical information system (GIS) is providing essential information on location with respect to natural resources, such as water and lacustrine distributions. Site maps are establishing a record of the current size of settlements and visible surface activities such as mud brick architecture, hearths, and manufacturing areas (for example, pottery and other pyrotechnical production).

Systematic Collections of surface pottery, small finds and manufacturing debris. The systematic collections of ceramics and small finds are providing detailed information that is being compared to the stratified sequence at Harappa. In many cases, we are able to determine the timing of site occupation within 200-year segments in order to understand when each site was originally occupied and when it was abandoned. This information is helping us to establish whether the rural settlements were established before or during the urban period at Harappa and whether they were abandoned at the same time as Harappa

or earlier. These questions are relevant to the circumstances under which urbanism occurred.

Analysis of Sediments with which to reconstruct the paleo-environment. A critical factor in our understanding of Harappan urbanism is the environmental conditions under which urbanism first occurred and at the other end, when it was abandoned. Extraction of sediments from cores set along several locations of the Old Beas bed have provided new information on environmental conditions and on the relative stability of the ancient river system at the onset of settlements.

The following preliminary results focus on the goals outlined in the above and provide some examples of specific sites that have been investigated. Although we have outlined the results from just a few settlements, a large database of collections and maps from other Beas sites partially confirms our current reconstructions. These data are currently being analyzed during our field season at Harappa.

BEAS REGIONAL SURVEY-PRELIMINARY RESULTS

Landscape Reconstruction and site Distribution: The Beas settlements are located on both sides of the river's dry bed and follow a linear pattern. Of the sites being investigated, there is a variation in size suggesting that a hierarchy of settlements existed along the Beas in ancient times. In fact, the four largest sites at Lahoma Lal Tibba, Chak 90-121, Vainiwal and Kusamsar are interspersed at regular intervals along ancient times and that exploitation of the Beas valley was heavily dependent upon its water and lacustrine resources.

At various locations in the survey area, there are hints of the original settlement pattern, in spite of the heavy cultivation of the region and encroachment on Harappan sites. For example, at the site of Vainiwal, where modern population densities are low, there are clusters of small and medium sized settlements near the site, possibly indicating that there was a continuous line of settlements throughout the Beas Valley in ancient times.

The small cluster that includes Harappa, Lahoma Lal Tibba and Chak Pirbane Syal (reported by the PAS as Chak 126-9L and Chisti Wala Tibba) provides a glimpse of one such cluster of settlements. Harappa is estimated to be ca. 150 hectares, Lahoma Lal Tibba, between 5 and 10 hectares, and Chak Pirbane Syal, less than 5 hectares. Lahoma Lal Tibba is 19 Km. from Harappa and Chak Pirbane Syal, 23 Km., as the crow flies. From this pattern, we have reconstructed a sequence suggestive of close political and economic ties, as will be discussed in more detail below.

In addition to the documentation of settlement location, our maps eventually will include geographical information, such as the locations of dunes, soils, available plant and other

natural resources. This evidence, when combined, will make it possible to reconstruct the nature of resource exploitation and provisioning at rural settlements.

Chronological and Cultural Reconstruction: The Harappan sites along the Beas are in a poor state of preservation and constantly being encroached upon by agriculturists and pastoralists. During the past four years of investigation by the Beas team, we have noted considerable destruction. To that end, our mapping project is designed to provide a record of the state of these settlements at the end of the 20th century. Sections of the high mounded sites are well preserved with the exception of the encroachment of tractor spoils from agricultural fields. To ascertain the extent of settlements, we have conducted walkovers of adjacent fields and interviewed local farmers to determine the original extent of sites. It is based on this information that contour maps have been prepared.

The two examples of contour maps (figures 1 and 2) prepared using a total Station demonstrates the precision possible with this equipment. The site of Lahoma Lal Tibba consists of a north and a south mound and although a power line and tower have been constructed between the mounds, we have been able to document its current condition and the relationship between the two mounds. (Surface features on Figure 1 are discussed below). Vats (1974) briefly described Chak Pirbane Syal. Currently, the mound has been split between into two villages, Chak 126-9L, and Chisti Wala Tibba as reported by the PAS (Pakistan Archaeology No. 29). After investigation of the two mounds, we determined that the two sites had originally be one mound and restored the designation, Chak Pirbane Syal, based on the original published name in the Vats publication (1974).

In spite of these condition, there are remnants of past activities visible on the surfaces of sites. These include evidence of pottery production and other pyrotechnical crafts, lithic scatters and mud brick houses and larger buildings. Based on burnt surfaces and manufacturing debris, the map (Figure 3) of Lahoma Lal Tibba shows the extensive evidence for pyrotechnical activities on the south mound visible to a lesser degree on the settlement. Examination of artifacts associated with these features is being carried out during our current field seasons at Harappa.

In addition to mapping sites, we conducted extensive collection of ceramics and small finds the strategy was designed to optimize our results with a minimum of disruption of site surfaces. We also employed a 5-10% collection strategy at each site in order to compare our results statistically. Individual mounds were divided into quadrates to obtain full site distribution and within quadrates random 5x5 squares were selected for investigation. Within each square, all shreds, nodules, terracotta cakes, small finds and other cultural debris were counted and weighed. Diagnostic materials and small finds

Fig. 1

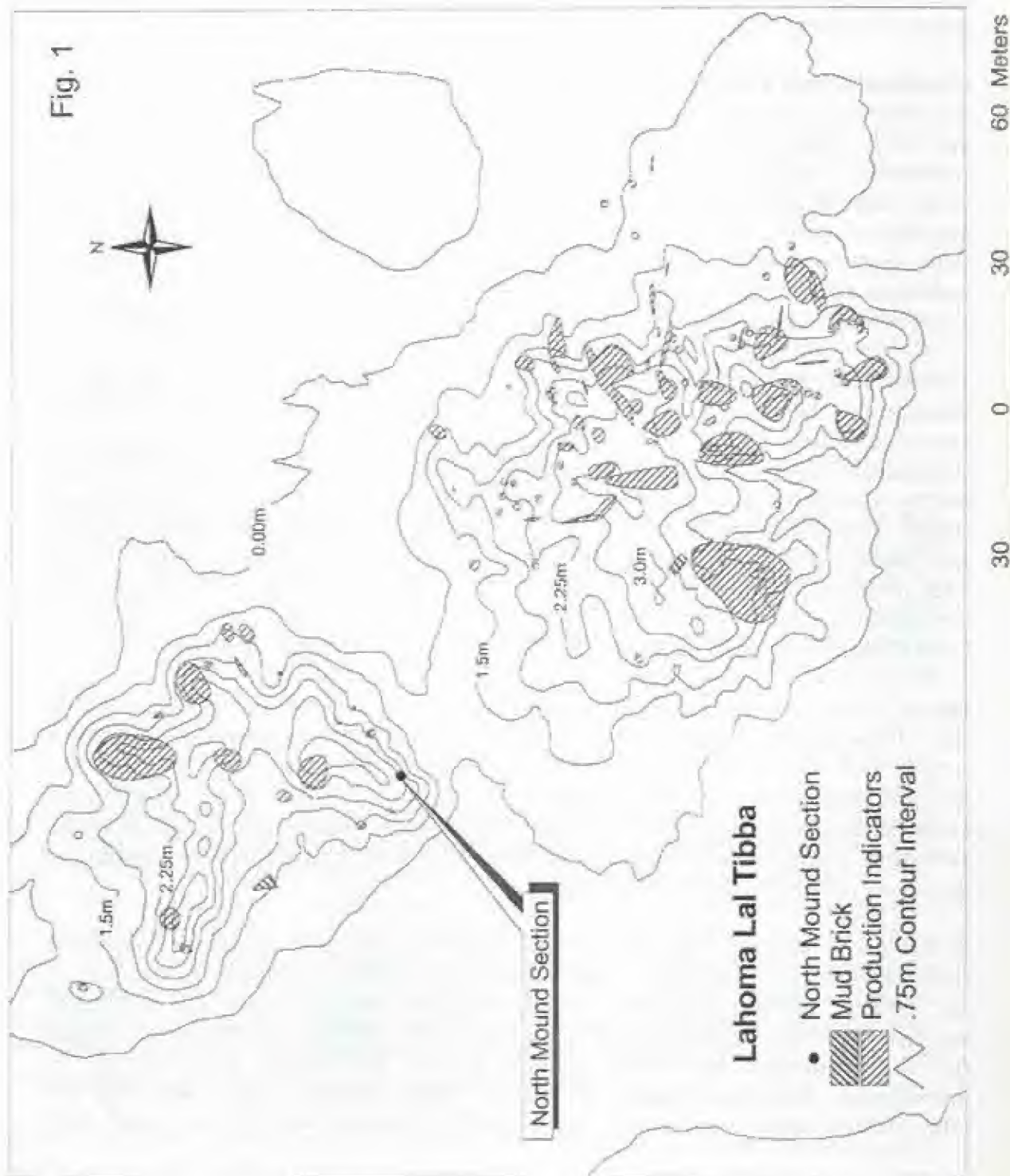


Fig. 2

Topographic map of the study area showing the location of the modern irrigation canal, modern compound, and modern crop field. The map includes contour lines with elevations of 1.0m, 2.0m, 3.0m, and 4.0m. A north arrow is present in the upper left corner. The modern irrigation canal is shown as a thick black line running from the bottom left towards the center. The modern compound is a cluster of black rectangles in the center. The modern crop field is a large area on the right side of the map.

Chak
Pirbane Syal

with previously unreported

Abstract

1.5 Meter Contour Interval



were collected for additional study, but all other materials were left in situ and thus are available to future researchers.

At Lahoma Lal Tibba this strategy has yielded important results. Since all materials were closely examined on site, we were able to identify diagnostic attributes that might not have been noticed from the usual walkovers that have formed the basis of many collection strategies. Based on this intensive examination, the team discovered several body shreds of pointed based goblets that were stamped with a Harappan seal before firing. Identical seal impressions of Harappan script on pointed based goblets have been found at Harappa, suggesting that close ties were maintained between Harappa and Lahoma Lal Tibba.

The evidence of script at Lahoma Lal Tibba also indicates that people at smaller sites outside of major cities, like Harappa, were conversant with Harappan script. Even more suggestive are our discoveries at the site of Vainiwal, where there is a sequence of Early Harappan graffiti, like that found at Harappa, and during the Mature Harappan, the use of small shreds (ostracons?) on which Harappan script has been inscribed. These post-firing inscriptions on shreds may be a local imitation of the preformed steatite 'tablets' found at Harappa. We also believe that the presence of identical inscription on Early Harappan shreds is an indication that people at small sites participated in the development of the Harappan script.

Our systematic collections also yielded important information with respect to cultural sequences. Using Lahoma Lal Tibba as an example, we now have evidence with which to reconstruct a sequence divisible into two hundred-year segments. The PAS had already determined that the site had early Harappan levels (ca. 2800-2600 B.C.E), that has been substantiated by our collection. Thus far, we have not found any materials preceding the Early Harappan that are comparable to the Ravi Period at Harappa (ca. 3300-2800 B.C.E). In the Mature Harappan, we have reconstructed three phases. A large Harappan pot that was eroding from a footpath used by local villagers on the south mound was rescued and restored and now is stored in the Harappa Museum collection. Pottery of this type has been found in secure stratigraphic contexts at Harappa in its Period IIIa (ca. 2600-2450 B.C.E). Decorative designs and figurines on other finds show that the site continued to be occupied in Period IIIb (ca. 2450-2200 B.C.E), and the impressed pointed based goblet with a seal found at Harappa indicates occupation at Period IIIc (ca. 2200-1900 B.C.E). Thus far, we have no indications of occupation after the urban phases at Harappa, although at the nearby site of Chak Pirbane Syal occupation continues into that period.

Environmental Reconstruction: The site of Lahoma Lal Tibba has also yielded important information with which to reconstruct environmental conditions. The alluvial and cultural

sequence at Lal Tibba is based on the examination of a profile exposed during a recent Mela and a 3 meter core probe into the substrate off the edge of the mound. Together, the profile and core are nearly 9 meters in thickness and preserve three complete cycles of alleviation and soil formation and form the basis on which the alluvial and cultural sequence at Lal Tibba have been reconstructed. Two cycles span the end of the Pleistocene and the present, with the key date of 13,050 \pm 60 B.P., signifying the terminal Pleistocene soil. A protracted period of weathering (marked by a Bwk horizon) correlates with the known period of climatic optimization across South Asia during the Early Holocene. Atop this sequence (an upper A horizon) is the base of the mound, dated to 3990 \pm 60 B.P., with a calibrated intercept date of 2480 B.C. This determination is in accord with the cultural materials preserved in the lower mud-brick sediment near the base of the mound. Effectively 10,000 years of warm and moist environments are bracketed in the sequence. An additional radiocarbon determination comes from a remnant of the Old Beas that is 3-4 m. above the floodplain. Its stratigraphy contained an organic matrix indicative of an ancient pond or swamp. The determination of 15,720 \pm 70 BP is consistent with an older Pleistocene base level of the Beas and may correlate with Palaeolithic-aged terraces of the river that have been documented upstream. These data provide the first dated evidence of a major interval of Beas valley down cutting subsequent of 15,500 BP. It is probable that this phase of incision was the precursor to the present in filled, sluggish hydrographic system. Radiocarbon determinations from cores extracted at other Beas settlements and sediments at Harappa are consistent with these findings.

Thus far we have obtained twenty-three radiocarbon determinations from cores and exposed profiles at other sites. They indicate that these stable conditions, with some variations, were present throughout the survey area, thus documenting pre-cultural environmental conditions from 15,720 B.P. to 4840 B.C.E. Our radiocarbon determinations shown on Table 1 below for Lahoma Lal Tibba, Chak Pirbane Syal and Harappa are examples of the chronological evidence we have collected. This series of dates for the cultural sequence at the two Beas sites is consistent with materials studied from our surface collections. They also are consistent with our reconstructions of environmental and alluvial conditions which indicate that the onset of occupation of the Beas River system was coincident with a period of stability and that people did not attempt to settle the plain until before the 5710 B.C. determinations from Lahoma Lal Tibba. The stable conditions now known to have existed after that date would have made the upper Indus a prime environment for the agricultural and pastoral practices that persist in the present.

Table 1. Radiocarbon Ages for Beas settlements

Site	Conventional C14 Age	Sample Age	Context
Chak Pirban Syal	3780+/- 70 B.P.	2190 B.C.	Charred Material/ Upper Cultural
Lahoma Lal Tibba	3780+/- 70 B.P.	2200 B.C.	Upper Cultural
Lahoma Lal Tibba	3980+/- 40 B.P.	2475 B.C.	Charred Material/ Upper Cultural
Lahoma Lal Tibba	3900+/- 40 B.P.	2430 B.C.	Organic Sediment/ Lower Cultural
Lahoma Lal Tibba	3960+/- 40 B.P.	2470 B.C.	Charred Material/ Lower Cultural
Lahoma Lal Tibba	3990+/- 40 B.P.	2480 B.C.	Charred Material/ Earliest Cultural
Lahoma Lal Tibba	6760+/- 40 B.P.	5710 B.C.	Charred Material/ Earliest Cultural
Lahoma Lal Tibba	13,050+/- 60 B.P.	13,050 B.P.	Organic Sediment/ Middle Alluvium
Harappa	11,270+/- 40 B.P.	11,220 B.P.	Organic Sediment/ Upper Alluvium
Harappa	13,090+/- 40 B.P.	13,090 B.P.	Organic Sediment / Middle Alluvium

*Intercept of radiocarbon age with calibration curve.

CONCLUSION

The examples from Lahoma Lal Tibba and Chak Pirbane Syal illustrate the utility of the regional survey approach and the environmental and cultural reconstructions possible using the methods described. Based on our preliminary assessments, we have reconstructed a sequence of development that can be tied to the establishment and expansion of Harappa. The Beas River settlements, with the possible exception of one or two sites in the survey area, appear to have been occupied slightly later than Harappa. Like Harappa, some grew to substantial size, while other smaller sites developed along with them. Harappa was situated on the Ravi River, where it exploited available resources as Harappa expanded into its urban form. This expansion of Harappa in conjunction with the appearance of new settlements is indicative of the importance of resources provided by the network of rural sites along the Beas. It seems doubtful that Harappa could have expanded to its urban size without them. Harappa was situated on the

Ravi River, where it exploited available resources within the Ravi system. The location of settlements along the Beas provided new resources with the appearance of new settlements is indicative of the importance of resources provided by the network of rural sites along the Beas. It seems doubtful that Harappa could have expanded to its urban size without them.

The founding of new settlements along the Beas River system extended the ecological niche occupied by Harappa. New resource procurement zones conducive to agricultural expansion would have increased plant resources at the same time that additional grazing areas for animals became available, thus fostering greater availability of meat and byproducts from large mammal exploitation. An ongoing program of phytolith analysis and our GIS inputs hopefully will provide relevant data with which to establish the validity of these inferences.

The Beas also may have served as a conduit for distribution of materials both between Harappa and rural settlements in the region as well as to the wider world of the Indus Valley civilization. Access to settlements to the south, such as at Mohenjo-daro, and to the east in Cholistan would have been enhanced by its strategic location between these regions and procurement zones to the north and west.

This brief outline of a reconstructed sequence that provides an urban context for Harappa and a small section of its hinterland provide a fuller picture than has been available in the past. In framing our research we had hoped to be able to demonstrate landscape aspects of site selections, occupational histories, and the relationship between Harappa and its hinterland. We did not conceive of these hinterlands in simple core/periphery terms but hoped to flesh out the nature of the complex relationships between city and countryside and the instrumentalities by which goods and services flowed among them. We are beginning, as our example of the small cluster of settlements near Harappa demonstrates, to realize our goals by providing a window into the first urban climax in South Asia.

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THE MYTHICAL TWINS: ARYAN INVASION OF INDIA' AND 'EXTINCTION OF THE HARAPPAN CULTURE'

B.B.Lal

Towards the end of the nineteenth century an eminent German scholar, F. Max Muller, made an astonishing statement the Rigveda was to be dated around 1200 BC. Accepting that the Sutra literature existed around the 6th-5th century BC, he assigned a period of 2000 years to each of the successively preceding groups of literary productions, viz. the Aranyakas, Brahmanas & Vedas. It is in this arbitrary manner that he arrived at the figure of 1200 BC. When criticized by such scholars as Goldstucker, Whitney and Wilson, Max Muller toned down his stand by stating (Preface to the Rigveda):

I have repeatedly dwelt on the merely hypothetical character of the dates, which I have ventured to assign to first periods of Vedic literature. All I have claimed for them has been that they are minimum dates, and that the literary productions of each period which either still exists or which formally existed could hardly be accounted for within shorter limits of time than those suggested.

However, he made his final exit when he confessed (Max Muller 1890, reprint 1979): If we now asked as to how we can fix the dates of those periods, it is quite clear that we cannot hope to fix a terminum a qua [sic]. Whether the Vedic hymns were composed [in] 1000 or 2000 or 3000 years BC, no power on earth will ever determine.

The pity is that in spite of such a clear-cut retreat by the clergy himself, his earlier fatwa still holds the ground and many Western and Indian scholars continue to swear by 1200 BC as the date of the Rigveda.

That was the scenario on the literary front towards the end of the nineteenth century. But the ground reality still was that even as late as 1920, Western scholars denied to India any iota civilization prior to the invasion of Alexander in 326 BC.

However, from 1921 onwards there was a sea change in the situation. There were the most remarkable archaeological discoveries at Harappa & Mohenjo-daro, which, in a single stroke, threw back the antiquity of Indian civilization from the third century BC to third millennium BC. This civilization in some ways even excelled the contemporary civilizations of Egypt & Mesopotamia. Not only did the Indian civilization cover a much vaster terrain than did either of the aforesaid western civilizations, but it also produced ample evidence of systematic town-planning and an underground system of drainage. The use of kiln-fired bricks, unknown to the then western world, was a common feature at the

Indian sites. The people produced all kinds of abject d'art, so much so that the excellency craved steatite seals can well by the envy of any seal-cutter, past or present.

With the discovery of the Harappan Civilization it was natural to ask a simple question, viz. who were its authors? Since Max Muller had given the fatwa that the Vedas were not earlier than 1200 BC and this newly discovered civilization was ascribable to the third millennium BC, it was argued that it could never have been the creation of the Vedic people, who were termed as the Aryans. (Here, perhaps it needs to be clarified that in the Vedic texts the word 'Arya' was not used in any racial sense; it only meant the 'noble one'.) Further, since India has two dominant language group, viz. the Sanskrit and the Dravidian, it was held that the Dravidian-speakers were the authors of the civilization. While we shall deal with Harappan-Dravidian equation a little later, we may continue with the crescendo of the 'Aryan invasion' theory.

In 1946 Mortimer Wheeler carried out further excavations at Harappa and brought to light a fortification wall around one of the mounds over there. However, the way in which he interpreted this discovery was both dramatic and unwarranted. He averred (Wheeler 1947:82):

The Aryan invasion of the Land of Seven Rivers, the Punjab and its environs, constantly assumes the form of an onslaught upon the walled cities of the aborigines. For these cities the term used in the Rigveda is *pur*, meaning a 'rampart', 'fort' or 'stronghold'. Indra, the Aryan War-god, is *purandara*, 'fort-destroyer'. He shatters 'ninety forts' for his Aryan protege Divodasa. Where are –or were – these citadels? It has in the past been supposed that they were mythical, or were 'merely places of refuge against attack, ramparts of hardened earth with palisades and a ditch'. The recent excavation of Harappa may be brought to have changed the picture. Here we have a highly evolved civilization of essentially non-Aryan type, now known to have employed massive fortifications, and known also to have dominated the river-system of north-western India at a time not distant from the likely period of the earlier Aryan invasion of that region. What destroyed this family settled civilization? Climatic, economic, political deterioration may have weakened it, but its ultimate extinction is more likely to have been completed by deliberate large-scale destruction. It may be no mere chance that at a late period of Mohenjo-daro men, women and children appear to have been massacred there. On circumstantial evidence, Indra stands accused.

As would be clear from the following there are many discrepancies in the data relating to the alleged 'massacre' at Mohenjo-daro. First of all, if these skeletons are at all to be

associated with a massacre by invaders, one rightly expects that these would have come for one level which would also be the latest, since thereafter the site is stated to have been abandoned. But the hard evidence is that these skeletons came from various levels, some from the middle and some from the late. To add to the fuzzy picture of their provenance, some skeleton were found even in deposits which got accumulated after the site had been given up. Secondly, all skeletons came from the Lower Town, which was inhabited by the commoners, but none from the Citadel - the seat of the government. One might well ask: why did the invaders spare the rulers and concentrate only on the general public? Thirdly, a closer examination of the skeletons revealed that some of these bore cut-marks, which had been healed. Had these persons died as a result of a massacre by the invaders, the death would have been immediate and there would have been no time for the cuts to have healed. Thus there is no case for a massacre and a distinguished archaeologist from the University of California, Berkley, George F. Dales (1964), has rightly dubbed it as a 'mythical massacre'.

One normally expects that a scene of warfare would leave some vestiges of war weapons. Let it be squarely stated and realized that at no site of the Harappan Civilization, be it Mohenjo-daro or Amri Sindh or Harappa in Punjab or Kalibangan in Rajasthan or Banawali in Harayana or Lothal and Dholavira in Gujarat is there any evidence of war-vestiges or of material remains which can be associated with any aliens. For example, the cultural milieu that occurs in the upper levels at Mohenjo-daro, going by the name of the Jhukar Culture, has clearly been demonstrated by Mughal (1992) to have been a devolution from the Harappan culture itself. At Harappa the recent work of Meadow and Kenoyer (successive annual reports in press) has shown a transition to what has been called the Cemetery Culture. In Gujarat, yet another local culture called the Rajanpur Culture (Rao 1979 and 1985), represent this transition. Where then is any evidence of supposed invaders, much less the Aryans? Indra, therefore, stands exonerated!!

Here it may not be out of place to quote, on this topic, the views of the few distinguished archaeologist from across the world. In 1988, Colin Renfrew, from the UK made this very point as follows (1988:188 and 190):

When Wheelers speaks of the invasion of land of seven rivers, the Punjab has no warranty at all, so far as i can see. If one checks the Dozen references in the Rġveda to the seven rivers there is nothing in any of them that to me implies invasion. Despite Wheeler's comments, it is difficult to see what is particularly none Aryan about the Indus Civilization.

From the across Atlantic comes another strong rebuttal namely by Jim G. Shaffer and Diane Liechtenstein. In a paper under publication, they state:

A few scholars have proposed that there is nothing in the literature firmly placing the Indo-Aryan outside of South Asia, and now archaeological record is conforming this. As a data accumulate to support cultural continuity in South Asian pre-historic and historic periods, a considerable restructuring of the existing interpretive paradigms must take place. We reject most strongly the simplistic historical interpretations, which date back to the Eighteenth century, that continue to be imposed on South Asian culture history. These still prevailing interpretations are significantly dimensioned by your peon Ethnocentrism, Colonialism, Racism and anti-Semitism.

This aspect of cultural continuity is fully supported even by that of Biological continuity. And here is what Hemphill and his colleagues have to say in the matter (1991: 137):

As for the question of Biological continuity within the Indus Valley, to discontinuities appear to exist. The first occurs between 6000 and 4500 BC. The second occurs at some point after 1800 BC but before 200 BC.

From what has been stated above it would be absolutely clear that no new people entered the Indus valley between 4500 BC and 800 BC. So where is any case for an Aryan Invasion around 1500-1200 BC, as has all along been orchestrated?

Earlier we had said that we would examine the Dravidian-Harrapan equation a little later. In recall the context, since the Max Muller had given the Fatwa that the Vedas were unlikely have been earlier than 1200 B.C. and since the Harrapan civilization was dated to the third millennium B.C., it was but natural to conclude that the Vedic people could not have been the authors of this civilization. Further, since the other dominant groups in the country were that of the Dravidians, - speaking people, it was taken as a gospel truth that the Harrapan must have belonged to this group.

In support of the Harrapan / Dravidian equation many other ingenuous arguments have been advanced. In small pocket of Baluchistan there live some people who speak a dialect called Brahui. It is held by the protagonists of this theory that when the Dravidian-speaking Harrapan were ousted by the invading Indo-Aryan, a small community of the Harrapan managed to escape the onslaught and is now available to us in the form of this tiny Brahui-speaking population. Let it be stated that not all linguists agree that Brahui is indeed a Dravidian tongue. According to some, it is more like the 'modern colloquial eastern Elamite'. Some others hold that the Brahui-speaking people are not the original inhabitants of the area but migrated there during the medieval times.

Equally baseless are other arguments in favour of harappan –Dravidian equation. For instance, it has been suggested that invading arians pushed the Dravidian speaking harappans all the way down to south India. This stand is *prima facie* wrong. Had the harappan indeed being sent away to the that region, we should come across harappan sites in the Dravidian speaking areas, viz. Tamil Nadu, AndhraPardesh, Karnataka and Kerala .the fact, on the other hand, is that there is not even a single site of the harappan civilization in any of these states. The only archaeological remains of a comparable antiquity in these regions are those of the southern Neolithic culture .are we then to believe that a full-fledged Bronze Age civilization over night degenerated in to a Neolithic one? This is just not possible.

Let us look at the issue from an other angle. It has been observed that if in an area where the inhabitants speak a particular language, say X, there is an influx of an other set of people speaking a language called Y, there will still remain remnants of the earlier language X. This is particularly reflected in the names of some of the rivers and mountains and even of some localities. Thus, for example, the names of the well known North American rivers Missouri and Mississippi or of cities like Chicago and Massachusetts are carry-overs from the language of the original American inhabitants now called the Red Indians. This is the case in spite of the fact that after the European migration to USA, the people speak the European languages, in particular English. The same is the story in Europe where names of many places, rivers and mountains of the earlier languages have continued even after the spread of the present-day European languages. On this analogy, one expects that at least some places, rivers and mountains would have retained Dravidian names if the Harappans spoke that language, even if they had been ousted from their original habitat, which was the entire region from the Indus in the west to the Yamuna on the east. The total absence of any Dravidian names in this region clearly militates against the Harappan-Dravidian equation.

To discuss yet another argument that has been adduced in favour of the Harappan-Dravidian equation. There occur in the Vedas a few words, which may have been derived from the Dravidian languages. On this basis it has been held that the invading Vedic Aryans picked up these words from the Dravidian-speaking Harappans whom they conquered. While there is no doubt that the Dravidian words could have been borrowed by the Vedic people only through some kind of contact with the Dravidian-speaking people, it has been shown earlier that there was no Aryan invasion whatsoever. Hence the borrowing of the Dravidians words by the Vedic Aryans cannot be explained by this mechanism. Under such a situation, there is another possibility, which can explain this borrowing. As a working hypothesis let it be assumed for a while that the Harappans themselves were a Sanskrit-speaking people (more will be said about it later). In that case they could have easily borrowed some Dravidian words from the Southern Neolithic

people, who are the most likely candidate for having spoken that language. (Ever since the dawn of history, Dravidian is the only language known to have been spoken in that region.) We also know that the Harappans got their gold-supply from the mines in South India. Because of this line of contact it would have been normal for the Harappans to have picked up some words from the South Indian Neolithic people.

By now we have demonstrated that: (i) the 'Aryan-invasion' theory is nothing but a myth and (ii) the Harappans are unlikely to have been a Dravidian-speaking people. These formulations lead us to yet another enquiry, viz. were the Harappans themselves the much-debated Aryans? Against the Harappan-Aryan equation, however, several objections have been raised from time to time, and we shall now deal with them one by one.

The first and most formidable mental barrier that had been created against a Harappan-Aryan equation is that of chronology. Since the Harappan Civilization dates back to the third millennium BC and since according to the fatwa of Max Muller the Vedas are only as old as 1200 BC, it was but natural for all concerned to hold that the two cannot be equated. However, as we have already noted, Max Muller clearly distanced himself from this hard line (above, p. ***). Yet it is a pity that even now some scholars with a particular mind-set, both in the west and east, are trying to hold on to the sinking ship.

Many distinguished astronomers have drawn our attention to the data given in the Vedic texts about the position of the *Naksatras*. For example, the *Aitareya Brahmna* refers to the shifting of the vernal equinox from the *Naksatra* Margasiras to Rohini. According to these astronomers this event is likely to have taken place around 3500 BC. The implication of it would be that the *Rigveda* would have to be dated still earlier. Not being an astronomer myself, I am in no position to offer any comments. All that I would urge that it would be unscientific to just pooh-pooh the idea. It was high time that experts from all over the world, having knowledge of both Sanskrit and astronomy, sat together and thrashed out the issue.

However, let us see what archaeology has to say in the matter. We are all familiar with the Bughaz Keui inscription assignable to the fourteenth century BC. It records a treaty between the Mitanni king Matiwaza and a Hittite king Suppiluliuma. In it four deities are invoked, namely Indra, Mitra, Varuna and Nasatya. These are doubtless Vedic gods. The presence of the Vedic Aryans in that region is once again attested to by a treatise which offers instructions regarding horse-training, using Sanskrit terms like *ekavartana*, *trivartana*, *panchavartana*, etc. There are many more documents from Western Asia which point to their Sanskritic origin. Analyzing the entire issue, the distinguished scholar T. Burrow (1955: 29) has very aptly remarked: The Aryans appear in Mitanni

from 1500 BC as the ruling dynasty, which means that they must first have entered the country as conquerors.* Conquerors, from where? One might ask. At that point of time there was no other country in the world where these gods-Indra, Mitra, Varuna, Nasatya were worshiped, except India. One cannot, therefore, escape the conclusion that the conquerors must have gone from this region. Anyway, on the basis of this evidence, the Vedas must be dated at least prior to the fourteenth century BC.

We may now move on to another very significant evidence. It comes from a combination of archaeology, geomorphology and the Vedic texts. The Harappan settlement at Kalibangan in Rajasthan was abandoned while it was still in the Mature stage. This happened because of the drying up of the river Sarasvati (now known as the Ghaggar) on whose bank it stood. This evidence has been thoroughly worked out by a team of Italian and Indian geologists and Raikes, the leader, aptly gives his paper (1968) the title: 'Kalibangan: Death from Natural Causes.' According to the evidence of radiocarbon dates, this abandonment took place around 2000-1900 BC (Lal 1997: 245-46).

Now if we go into the textual evidence we find it very rewarding. During the days of the *Rigveda*, the Sarasvati was a mighty river, flowing all the way from the mountains to the sea. For example, *RV.1.51* Verses 1 and 2 run as follows:

*pra ksodasa dhyayasa sasra esa Sarasvati dharunamayasi puh / prababadhana
rathyevayati visva apo mahina sindhuranyah ||1||
ekachetat Sarasvati nadnam suchiryati giribhya a samudrat I rayaschetanfi
bhuvanasya bhurerghritam payo duduhe Nahusaya ||2||*

The Sarasvati gushes forward with her waters and protects all like a metal fortress; with her might, like a charioteer she surpasses (lit. obstructs) all other waters (rivers). [1] Purest among all the rivers and vibrant, the Sarasvati moves on from the mountains to the ocean; manifesting immense riches of the world, she has provided milk and *ghee* (clarified butter) to Nabusa. [2]

Putting together the entire archaeological, radiocarbon-dating, geological and literary evidence, the following conclusion becomes inescapable, viz. that since during the Rigvedic times the Sarasvati was a mighty flowing river and according to the archaeological-radiocarbon-dating-cum-geological evidence this river dried up around 2000 BC, the *Rigveda* has got to be earlier than 2000 BC. How much earlier, it would, of course be anybody's guess. (Though not quite connected with the present issue, it may be added that the *Pancha virfis'a Brahmana* (XX V.1 0.16), which makes a categorical reference to the drying of the Sarasvati, will have be dated *after* 2000 BC.)

To the foregoing discussion I would like to add one more factor, namely that of the Vedic geography. The famous *Nadi-stuti* hymn in the *Rigveda* (10.75) runs as follows:

*imam me Gange Yamune Sarasvatī Sutudri stomam sachata Parusnya / Asiknya
Marudvridhe Vitastya Arjildye srimihya Susomaya || 5||*

Tristamaya prathanam yatave sajuh Susartva Rasaya Sverya tyā

Tvam Sindho Kubhaya Gomafim Krumum Mehatnva saratham yabhiriyaše || 6||

O Ganga, Yamuna, Sarasvatī?, Sutudri (Sutlej) and Parusni (Ravi),

O Marudvridha with Asikni (Chenab), O Arjikeya with Vitasta (Jhelum) and Susoma (Sohan), please listen to and accept this hymn of mine. [5]

O Sindhu (Indus), flowing, you first meet the Tristama (and then) the Susartu, the Rasa, and the Sveta (Swat), and thereafter the Kubha (Kabul), the Gomti (Gomal), the Krumu (Kurram) with the Mehatnu; and (finally) you move on in the same chariot with them (i.e. carry their waters with you). [6]

These verses, mentioning seriatim all the rivers from the Ganga in the east to the Indus along with its western tributaries on the west, clearly set out the area occupied by the Rigvedic Aryans. Further, as would be abundantly clear from the earlier paragraphs, the *Rigveda* must be dated to a period prior to 2000 BC. May not one now pose a simple question: Which was the material culture that covered the entire area from the Ganga in the east to the Indus on the west during the period prior to 2000 BC? If one thinks coolly and dispassionately, it becomes difficult to escape the conclusion that *it was none other than the Harappan Civilization itself*. However, in spite of what has been stated in the foregoing pages, it would be prudent to put the Aryan-Harappan equation on hold until the Harappan script is satisfactorily deciphered. It is needless to add that all the attempts made so far have been abortive. (Sorry to say that, but see Lal 1970, 1974 and 1983 and Possehl 1996).

We may now examine the other major assertion of Wheeler, namely that, as a result of the 'Aryan Invasion' (so called by him), the Harappan Culture became 'extinct'.

As would be clear from the paragraphs that follow, there is no truth whatsoever even in this statement. What had really happened is that the curve of the Harappan Civilization, which began to shoot up around 2600 BC and reached its peak in the centuries that followed, began its downward journey around 2000 BC. Not one but several factors seem to have contributed to it. For example, overexploitation and consequent wearing out of the landscape and probable change in the climate may have told upon agricultural production. Further, the drying up of the Sarasvatī around 2000 BC must have made it necessary for the people to leave this basin and move northeastwards in search of water and arable land. And to cap it all, there was a marked fall in trade, both internal as well as

external. The latter is duly reflected in the decrease of antiquities of Harappan origin in Iraq, Iran and Central Asia towards the end of the third millennium BC. With this kind of a situation there is bound to have taken place an all round deterioration. And this is duly reflected in archaeological records all over the Harappan domain. As already stated earlier(p. ***), the Mature stage of the Harappan Civilization at Harappa began to decline and gradually transformed itself into what is known as the Cemetery H Culture. In Sindh, sites like Mohenjo-daro, Amri, etc. show another facet of this transformation, in the form of the Jhukar Culture. Gujarat has its own story to tell. At Lothal, the Mature Harappan Civilization began to register a decline in the upper levels of the site. The story of this decline/degeneration is continued at the nearby site of Rangpur, where this transformed assemblage goes by the name of the Rangpur Culture. The Mature Harappan settlements in Rajasthan and Haryana had to be abandoned because of the drying up of the Sarasvati. The people were forced to move northeastwards into the upper Ganga - Yamuna valley where we have Late Harappan sites like Hulas and Alamgirpur. To cut the long story short, in every region of the Harappan Civilization there was a localized transformation/degeneration/decline - call it by whatever name you wish. But there was no 'extinction'. The result of it all was that the various urban components of the Harappan Civilization, such as the meticulous town planning and an underground drainage system, were no longer to be seen. Likewise, weights, measures and seals, all of which were needed for the conduct of trade, also disappeared. So did the writing, although it persisted in the form of graffiti for some time. The ultimate outcome was that while the urban centers disappeared, the rural scenario became self-assertive. Referring to this phenomenon, I have elsewhere parodied Tennyson's *The Brook*, and said that the Harappan villages must have whispered to one another:

C'ties may come and c'ties may go
But we go on forever.

In my latest (2002) book, *The Sarasvati Flows On*, I have dealt extensively with this aspect of continuity; and interested readers might like to go through it. Here, however, I would like to give just a few examples of this phenomenon. Briefly, whichever walk of life you take up you will find in it the reflection of the Harappan Culture: be it agriculture, cooking habits, utensils, personal make-up, ornaments, objects of toiletry, games played by children or adults, transport by road or river, folk tales, religion, yogic *asanas* and so on.

One sees a special kind of pattern of ploughing an agricultural field in northern Rajasthan, Haryana and western Uttar Pradesh. The furrows are in two sets, one running north south and the other east-west, cutting each other at right angles (Fig. 1). Precisely the same pattern was there during the third millennium BC, as duly established by an

agricultural field encountered in the excavations at the well-known Harappan site of Kalibangan (Fig. 2). Today mustard and horse gram are grown in these two sets and although no plants were actually found in the ancient field (evidently these did not

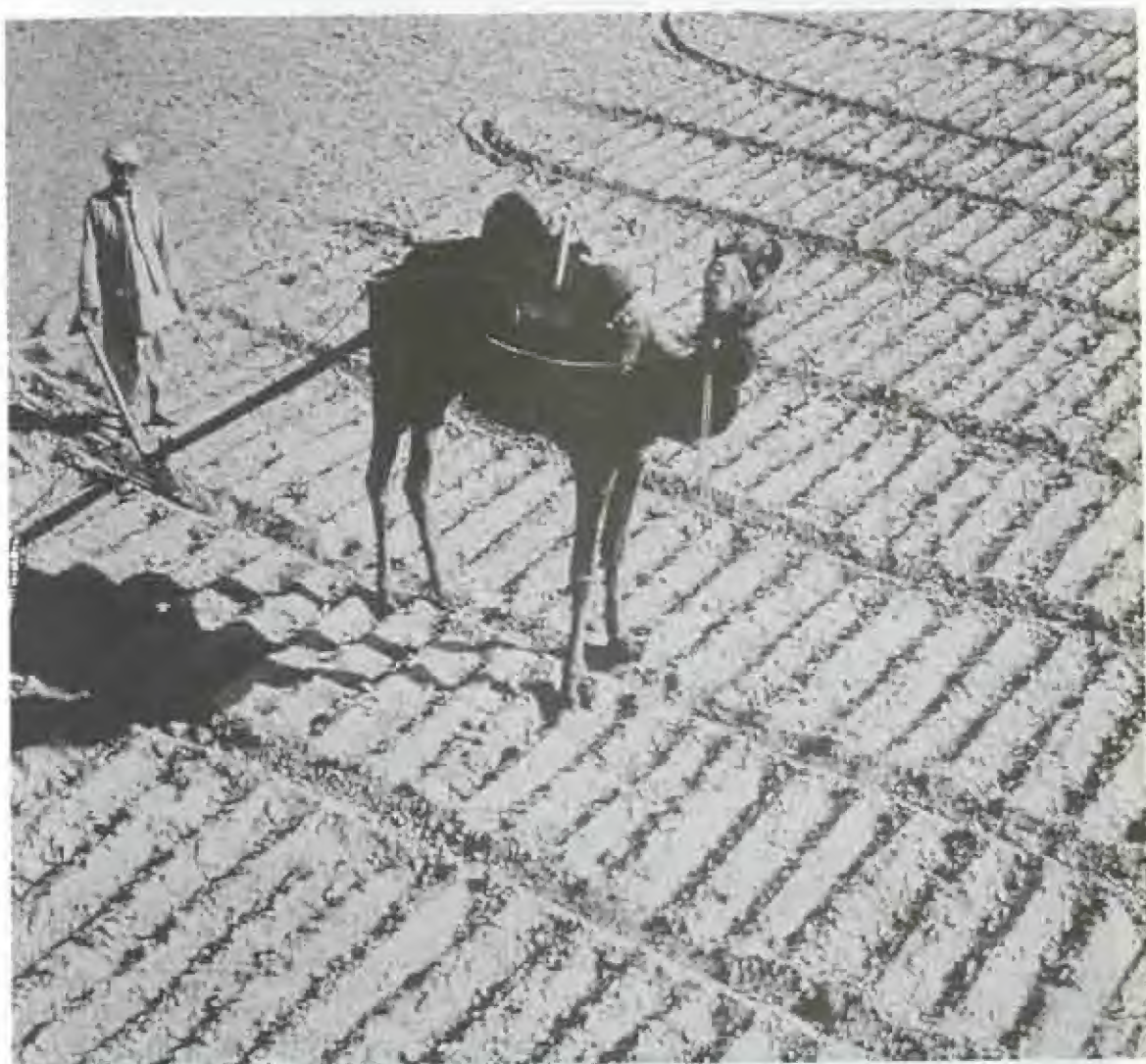


Fig - 1



Fig - 2



Fig. 3

withstand the ravages of time), it is important to note that both mustard and horse gram were amongst the crops grown by the Harappans.

If you wished to place an order for *tandoori rotis* (a special kind of bread) these ancient Kalibanganites will be only too glad to accept your order (cf. Fig. 3). Amongst your everyday utensils you would find the *thali*, *lota*, *handi* and even a handled frying pan in metal, way back in the Harappan assemblage. Further, be not taken aback if I told you that the *kamandalu* too was there in the third millennium BC.

In matters of transport there is quite a lot that has continued. One can still see cabined boats plying on the Indus, of the type depicted on a seal from Mohenjo-daro (Lal 2002: Fig. 4.44). The same is the case with the bullock-carts, whose shape has remained unchanged. But what is most surprising is that even the gauge of the cart has remained unchanged. Believe it or not, yet it is a fact that the gauge of a modern Sindhi cart, viz. 1.08 m, is exactly what was recorded in the case of cart-ruts encountered at Harappa during the excavations in 1946 (Lal 2002: Fig. 4.43).

Indian women, it has rightly been said, are the best preservers of tradition. A married Hindu woman makes it a point to apply *sindura* (vermilion) to the *manga* (the line of partition of the hair on the head). It is most surprising that female terracotta figurines of the Harappan times show this very kind of application. Terra cotta figurines from Nausharo, a Harappan site in Pakistan. In these, the craftsman has painted these terracottas with three colours. The ornaments have been painted with yellow to indicate that these were made of gold. The hair is naturally black. However, in order to signify the application of vermilion in the partition-line of the hair red colour has been used.

While there are many ornament-types, which show continuity, here we refer to only two. The 'dancing girl' from Mohenjo-daro wears, besides a necklace dangling between her breasts, a set of spiralled bangles on her left upper arm (Fig. 4). Ladies in Rajasthan and Gujarat wear similar sets of bangles even today. Another very noteworthy ornament is what is called the *chauk*. It is conical and is worn on the head. In Lal 2002, Fig. 4.3 shows an example of it in gold from Mohenjo-daro, while in Fig. 4.4 of the same book there are two women of whom the newly married one wears it on her head underneath the *dupatta*. No less exciting is the continuity of a three-in-one toiletry gadget in copper. Fig. 5 shows a specimen from Harappa, while Fig. 6, a modern example. Of the trio, one is a tweezer, used for plucking unwanted small hair that sometimes grows on the underside of the eyelids; that with a tiny cup at the end is used for removing wax from the ears; while the one with a pointed end is used for cleaning the spaces between the teeth.



Fig - 4



Fig - 5



Fig - 6

Fig. 7



Many of the games played by children and adults today go back to the Harappan times, for example the game called *pittu*, played by children with terracotta discs (Lal 2002: Figs. 4.13-15). However, more exciting is the occurrence in the Harappan levels of a special kind of die, which is cubical in shape and bears on its six faces 1,2,3,4,5 and 6 circlelets respectively. Precisely the same kind of die is used even now (see Lal 2002: Figs. 4. 18-19). Further, there is evidence to suggest that even chess was played during the Harappan times. This is indicated by the occurrence of a variety of terracotta gamesmen, including those with animal heads, in the Harappan levels at Lothal (Lal.2002: Figs. 4.16-17).

Most of us would recall that as children we listened to tales narrated by our grandmothers at bedtime. It is indeed surprising that some of these stories are rooted in the Harappan Culture. For example, a scene painted on a pot from Lothal shows, from the left, the following: a crow, a pitcher, a tree, a deer and once again a tree. An outstretched leg of the deer indicates that he is in the process of leaving, but his turned-round face shows that he is watching (perhaps with amazement) what has gone on at the back. The crow has just raised his beak from the pitcher wherein a round object is meant to indicate a pebble and the blank space the water. This evidently is the portrayal of the well-known story of the 'Thirsty Crow'. As the story goes, a deer was thirsty and wanted to drink water from the pitcher. But the water level was low and because of his long antlers he could not insert his head deep enough into the pitcher. Disappointed, he was about to walk away. But just then a crow, who too was thirsty, approached the pitcher. On finding that the water level was low, he thought of an ingenuous way. As the story goes, he picked up some pebbles and dropped them in the pitcher. Thereby the water level rose and he was able to quench his thirst. The deer looked with amazement at what the crow had achieved by using his intelligence!

Religion normally has two aspects: one, philosophical or metaphysical, and the other, ritualistic. The former is generally ascertainable from written texts, whereas the latter leaves its evidence in the material remains. Since in the case of the Harappan Civilization we have no extant texts and the few seals that might have thrown some light on the subject cannot be interpreted because of our failure so far to decipher the script, it is difficult to reconstruct the philosophical aspects of Harappan religion. But there is enough evidence in so far as the ritualistic aspects are concerned, and here we shall deal with some of these, which will show that many elements of the Harappan religion have not died out, even with the passage of such a long time.

At Kalibangan, Banawali, Lothal and a host of other sites evidence has been found of a ritual associated with fire. In many of the houses in the Lower Town at Kalibangan oblong pits, about 25-30 cm in depth and about 1 x 1/2 m on plan, have been found.

These contained, besides charcoal and ash, a cylindrical clay stele in the centre, having a diameter and height of about 15 cm and 30-40 cm respectively. Around it were placed circular-biconvex terracotta 'cakes', as if in offering (Lal 1998: Fig. 12.1).

The location of the fire-altar was such that a person using it had to face the east. On a high mud-brick platform in the Citadel seven such fire-altars were found in a north-south row, with a wall behind (Lal 1998: Fig. 12.2). This would again indicate that the worshipper had to face the east. On the western side of these fire-altars there lay embedded in the ground the lower half of a jar with ash and charcoal in it, suggesting that fire was kept ready for the ritual, whatever may have been its other operational details. Very close to these altars, on the northwest, there were a well, a bathing pavement and a drain. This would suggest that ritual bathing formed a part of the ceremony. (Note: In the absence of a better term, the word 'fire-altar' has been used. However, it may be clarified that it has nothing to do with the fire-altars of the Parsis.)

There is also ample evidence of animal-sacrifice during the Harappan times. To get back to the Citadel-complex at Kalibangan. Not far from the 'fire-altar' platform there was another platform on which there lay a brick-lined sacrificial pit containing antlers and bovine bones (Lal 1998: Fig. 12.3). In this context it may be added that in a recent excavation at Harappa a plano-convex tablet in terracotta has been found, which depicts a person killing a buffalo in front of a deity identifiable as Siva (Lal 2002: Fig. 4.56). It is learnt that the practice of sacrificing a buffalo in front of Siva is still prevalent in parts of Himachal Pradesh.

The well known seal from Mohenjo-daro shows a god seated in a yogic posture, with animals around him (Lal 2002: Fig. 4.53). The figure, for good reasons, has been thought to be that of Siva in his *Pasupati* (Lord of Animals) aspect. That Saivism was prevalent during the Harappan times is duly borne out by a recent discovery at Kalibangan of a *linga-cum-yoni* in terracotta (Fig. 7). This is exactly what we see in the temples these days.

One may be surprised to find, yet it is a fact, that yogic *asanas* go back to the Harappan times. This is established by the terracotta 'models' thereof found at various Harappan sites. A second century BC text, namely the *Yoga-sutra* of Patanjali, deals with the Yogic practices as a whole. According to it there are eight steps/parts of Yoga, viz. *yama*, *niyama*, *asana*, *pranayama*, *pratyahara*, *dharana*, *dhyana* and *samadhi*. While we have just referred to the Harappans practicing the *asanas*, a careful look at the famous limestone figure of the priest from Mohenjo-daro would show that the sculptor had depicted him with introvert eyes, in what may be termed as the *dhyana-mudra* (Fig. 8).



Fig. 8

King Priest
Moenjodaro



Fig - 9

One does know how to classify the Hindu way of greeting one another, viz. the *namaste*. A religious practice or merely a social one? The term consists of two parts, viz. *namah* and *te*, which literally mean 'I bow' 'to you' respectively. However, the 'you' in it implicitly refers to 'God/Spirit' that is within you and not just to the body. With this meaning, the term has a religious overtone. Be that as it may, the hard fact remains that the Hindu way of greeting is rooted in the Harappan Culture (Fig. 9).

May we now have a look at the social stratification during the Harappan times? However, in ascertaining the same we are greatly handicapped by our inability to decipher the Harappan script. Were we able to read the inscriptions on the various Harappan objects, such as seals, sealings, pots, ivory and metal objects, etc., we would have possibly come across the names of some professions, or of guilds engaged in trade, or even surnames. That being not the case, we have to look to another kind of evidence, viz. the layout of the settlements and what it reflects.

As a type-study, we take up Kalibangan. There were two major parts of the settlement at Kalibangan, viz. the 'Citadel' on the west and the 'Lower Town' on the east, each being separately fortified (Fig. 10). Again, the Citadel itself had two divisions, one on the north and the other on the south, separated by a partition wall. In the southern part of the Citadel there were many platforms over which stood some significant structures, for example 'fire-altars' in one case and a sacrificial pit in another. (Since the other platforms have been badly eroded it was not possible to identify the structures thereon.) In contrast, the northern part of the Citadel had residential buildings and it has been surmised that here lived the priests who participated in as well as supervised the various rituals that were performed on the platforms in the southern part. All this evidence shows that there was a priestly class in the Harappan society. In fact, it reminds us also of the limestone bust of the 'priest', found at Mohenjo-daro.

In the Lower Town at Kalibangan there were no platforms or any special structural complexes. The settlement within the fortified area was divided into blocks by streets running north south and east west (Fig. 10). Each block comprised a few houses and each house usually had five to six living rooms, laid along three sides of a large courtyard. On the fourth side there was a wide entrance which allowed bullock-carts and domestic animals to freely get in. Within the courtyard there were troughs to hold fodder and water for the animals. One of the rooms was generally used for storage of grains, as indicated by the presence in it of storage jars. The overall setting of such houses indicates that herein lived the agriculturists. In some other houses were found a few seals as well, suggesting that the occupants also carried on trade. Thus, the Lower Town was the area wherein lived an agriculturist-cum-mercantile community.

Fig - 10



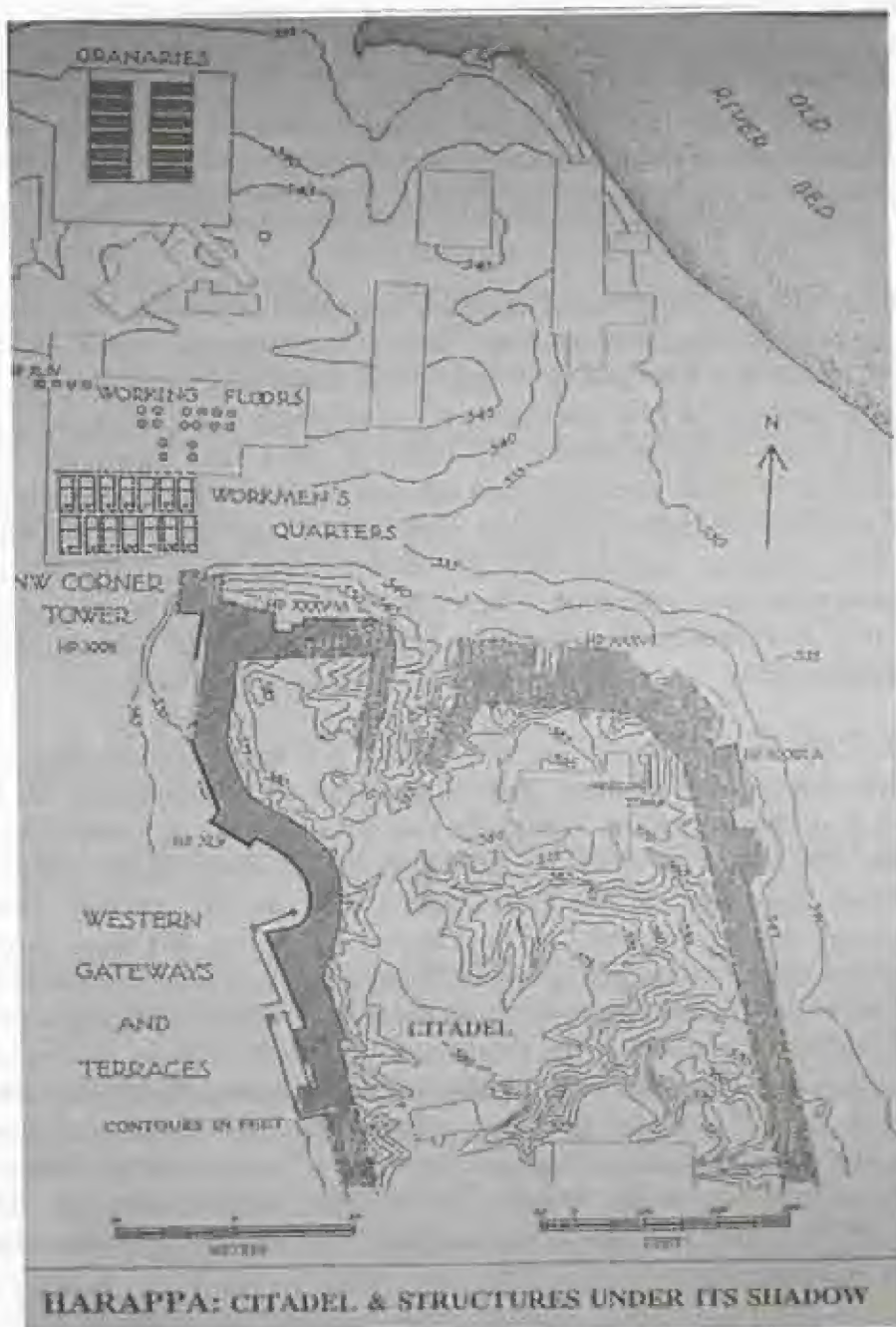


Fig - 11

South of the Citadel at Kalibangan there was an open (i.e. unfortified) area (Fig. 10). The houses here were much smaller than those in the Lower Town. Though the excavation in this part was not very extensive, at one location a large amount of broken pottery and ash were encountered, suggesting that somewhere in the neighbourhood may have lived the community of potters. The smallness of the houses combined with this pottery-evidence would suggest that in this unfortified part of Kalibangan there lived the labour class, attending to the needs of those who occupied the Citadel and the Lower Town. In this context one may well recall the working floors and workmen's quarters in the shadow of the Citadel at Harappa (Fig. 11).

Let it be added that Kalibangan and Harappa do not stand isolated in having this kind of settlement-pattern. Similar features are also there at Mohenjo-daro, Lothal and Dholavira (see Lal 1997: 229 ft.). The overall evidence thus clearly indicates that the Harappan society was divided into at least three classes, viz. a priestly class occupying the Citadel, an agriculturist-cum-merchant community living in the Lower Town and a deprived labour class living in small tenements in an area that was never fortified. Here it may also be worth stating that the occurrence of the same type of material in the successive strata of the houses concerned suggests that this kind of occupational division may have persisted generation after generation. That is to say, the occupations may have become hereditary. In such a situation there may have emerged what we have come to know in its fossilized form as 'caste'.

Admittedly, in the absence of documentary evidence it is not possible to know what were the respective designations of these three aforementioned classes during the Harappan times. Also, it is always risky to look at the past with present-day glasses. At the same time, it may not be out of place to refer here to the *Bhagvadgita* which, like the aforementioned *Yogasutra* of Patanjali, again stands roughly midway between the Harappan times and the present. In it (Chapter IV, Verse 13) Lord Krishna says: '*Chaturvarnyam maya sristam guna-karma vibhagasah*' i.e. 'I have carved out a four-fold division in the society in accordance with the nature and duties of the people concerned'. This fourfold division consists of the Brahmanas, Ksatriyas, Vaishyas and Sudras. If the ^7n<ar-(action-)based Harappan society fossilized in the course of time into a hereditary one, as seems most likely, the Harappan priestly class may have given rise to the Brahmanas, the agriculturist-cum-merchant class to the Vaishyas and the labour class to what came to be known as the Sudras. The later-day warrior class, viz. that of the Ksatriyas, may have also come into being when the need was felt for defence against any enemy in an organized manner.

To sum up. There is absolutely *no evidence* whatsoever at any of the Harappan sites *for any invasion, much less by the Aryans*. On the contrary, the Harappan Culture itself

underwent gradual decline due to a variety of causes discussed in the preceding pages. Thus, while urbanism became a story of the past, most of the (non-urban) cultural traits continued. There is *no case for extinction*. Both the theories, viz. 'Aryan Invasion' and 'Extinction of the Harappan Culture' are myths and deserve a ceremonial burial!!

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THE RISE AND FALL OF THE HARAPPAN CIVILIZATION IN THE LIGHT OF THE RECENT EXCAVATIONS IN INDIA

R.S. Bisht

SUMMARY

For long the Indus civilization remained as an isolated phenomenon with unknown beginnings or end. Much of the incoherence has since gone due to the last five decades of the concerted efforts of the archaeologists of India, Pakistan, UK, USA, France and to some extent, of those from Germany and Italy. An almost continuous sequence of archaeological cultures starting from the early farming communities of the pre-pottery Neolithic period of circa 7000 B.C. down to the beginning of the history of India around 600 B.C. has been obtained. The Harappa culture stands no longer in its majestic isolation. It is now abundantly clear that its birth was a logical culmination of a long cultural process which assimilated and accommodated multifarious elements and influences from a miscellany of preceding cultures which were flourishing in the 'greater' Indus and the upland valleys of Baluchistan and beyond. Forces of rapid integration brought about an over-riding unity over a vast area that approximated in extent the combined territories of ancient Egypt and Mesopotamia. Yet there survived regional characteristics which later on became dominant when the integration loosened and gave way to transformation which, in turn, succumbed to de-urbanization or ruralization. The urban features disappeared. After a long process of further deterioration in some areas and through a different process of devolution in the other, those ruralized cultures of the late Bronze or Chalcolithic age dovetailed or transformed themselves into one or another early Iron Age culture which finally merged into, or emerged as, one of the early Historical cultures during the sixth/fifth century before Christ.

Since independence, the archaeologists made substantial contributions to the Indus studies in both India and Pakistan and even elsewhere. In India, a larger number of sites were brought to light in the states of Punjab, Haryana, north Rajasthan, upper Yamuna Plain of Uttar Pradesh and many parts of Gujrat and some pockets in Maharashtra. Some of the sites were excavated and an enormous mass of information adding new dimensions to the culture, its antecedents and successor phases were gathered. Among important excavated sites in India are: Kalibangan, Lothal, Rangpur, Surkotada, Banawali, Kuntasi and the latest ones being Dholavira and Rakhigarhi, both among five or six largest Harappan cities in the subcontinent and both presently under excavation. As a result, it is now abundantly clear that its birth was a logical culmination of a long cultural process which assimilated and accommodated multifarious elements and influence from a miscellany of preceding cultures which were flourishing in the greater Indus Valley and the upland valleys of Baluchistan and beyond.

In the alluvial plain of north Rajasthan, Punjab and Haryana the pre-Harappan cultural strata have been noticed at several places. The earliest phase could be seen at Kunal (Haryana) where the people were living in large pits and using beautifully decorated pottery. Later on, the pits were used to be lined with mud bricks. The same people seem to have arrived a little later at Banawali (Haryana) and, still later, at Kalibangan (North Rajasthan) where, at both places, they had advanced planning and architecture. At Banawali they initially lived in mud brick houses in an open settlement which was subsequently enclosed by a wall which was designed like an apsidal or oval fortification following the existing contours of the dune on which the settlement perched. Brick sizes were standardized into a ratio of 3:2:1 in respect of length, width and thickness. In planning, some kind of street system was also in evidence. The next stage of progress was seen at Kalibangan where the settlement was planned largely like a rectangle having straight arms with some tortuosity in the north – western segment of the wall. There are many such contemporary settlements that have come to light in the valleys of the Sarasvati and its tributaries. Like Kot Diji and Rahman Dheri (both in Pakistan), Banawali and Kalibangan have provided evidence of fortification, planning and standardization. Kalibangan has also yielded a ploughed field meant for obtaining two crops at a time a new feature indeed. In Kashmir, a Neolithic culture revealing both a ceramic and ceramic phases was found at Burzahom and Gufkral where, at a later stage, it came in contact with the pre-early Harappans of the Kot Diji milieu.

In the eastern zone that spread over in the Sarasvati / Ghaggar valley and the Indian Punjab, no site has evidenced so far a logical evolution of the pre-Harappan into the succeeding Harappa culture. However, at Kunal and Banawali, there is found an intermediate phase in which many new elements which subsequently became essential cultural items of the mature Harappan period made their appearance in an assertive way. At Banawali, this phase is distinguished inter-alia by a wholesale demolition of the antecedent houses followed by construction of fresh ones in a new layout which, in turn, included enlargement of the earlier settlement into a bipartite one in which the one upon the preceding habitation was converted into a citadel and a general town was planned around it on the east, north and west. At Kunal, for the first time, rectilinear houses made of mud-bricks of both the pre-Harappan and Harappan standards were noticed. Furthermore, the site yielded tiny square seals bearing geometrical designs with a boss at the back. It was a new and important feature during the Proto-Harappan stage. The Proto-Harappan elements certainly arrived in this zone in a strong wave probably from the west, either Sindh or the Punjab where slowly and steadily the early Harappan were evolving vertically into the mature phase as can be seen at Kot Diji and now at Harappa, too.

At Kalibangan, as soon as the Harappan reached they laid out a planned town in accordance with their established norms as followed at Moenjodaro. However, at Banawali, they generously adopted to the general configuration of the kindred proto-

Harappans although the former, like the latter, did construct their house *de novo* and brought about marginal changes in the street system as well. These are the only sites, which have been subjected to a large-scale excavation. Rakhigarhi, another highly promising site in Haryana, is still at an early stage of excavation which may confirm or otherwise the view that the mature Harappa culture passed through the early stages of evolution elsewhere, outside the zone, or else, may force us to change our mindset about the cultural progression. Anyway, Banawali stands apart for its unusual town – planning which the Harappans had accepted in bequest. Belying the accepted norms, they had an apsidal citadel within a trapezoidal town – both being securely fortified. The citadel, of course, enjoyed a pre-eminent location within the town itself. It was not located separately as at Moenjodaro, Harappa, Kalibangan or Dholavira. The situation is somewhat like that at Lothal where the acropolis occupied a higher podium within the settlement itself. Furthermore, the lower town at Banawali was laid out with a radial system of streets, which, in turn, determined the unusually triangulate or trapezoidal form of residential sectors. Contrarily, the apsidal citadel had a formal arrangement of rectilinear street system and concomitant housing sectors. Another unique feature in the layout of the Harappan town at Banawali was the provision of a wide and deep moat that ran around the town wall. Banawali also earned the credit of yielding a clay model of Indus plough. Lothal, among other things, provided the earliest ever dockyard attached by the side of a which, in its turn, adjoins a warehouse. The planning of the settlement generally followed the conventional pattern and so did Surkotada in Kachchh (Gujarat).

Of all, Dholavira indeed enjoys a pre-eminent position on account of its excellent city planning, monumental architecture, efficient water – harvesting system, storm water drainage, funerary structures and also for yielding a stratified account of the rise and fall of the Indus Culture through seven successive stages. The culture started with nascent urbanism and passed through the stages of juvenescence, adolescence, culmination, maturity and decline, followed by transformation and finally the fall into de-urbanization or ruralization. The site has also earned the unique distinction of presenting the inscription of ten large – sized signs making perhaps the earliest signboard of the world. Besides, it has also provided the oldest and largest stadium together with a smaller one.

In terms of time, the first five cultural stages spanned the whole of the 3rd millennium B.C. while stage VI may be placed between 1900 B.C. and 1700 B.C., and the terminal phase was around 1500 B.C. In terms of traditional understanding of the culture, Stages IV and V revealed that well known aspect of the Harappan Civilization which has become deeply imprinted in the minds of the people at large and which is characterized by its planning, architecture, pottery, tools, the profusion of seals, the script and weights and others. It is, therefore, significant to state that the first evidence of seals, the writing and the weight appeared in Stage III albeit far lesser in quantity. The seals that are collected from this stage are small and light, square in shape and bear a small boss at the

back. All of them bear only figures or mythological scene but no inscriptions. On other side, stage VI, i.e. the late Harappan seals are mostly rectangular, rarely square or circular, and both the types bearing beautifully cut inscriptions only but no figures or scenes which were so prolific during the intervening period represented by States IV and V.

Stage VI is particularly worth mentioning as it helps understand sequentially and more logically a large number of sites which have yielded a baffling mass of material from all over Gujarat. That apart, it contemporary regional cultures that flourished elsewhere where the mature Indus Civilization once reigned supreme. This stage is characterized by a drastic transformation or departure as reflected in planning and architecture as well as in the absence of the preceding urban grandeur although many classical traditions in the ceramics as well as the accompanying antiquarian assemblage had survived. Many exotic ceramics got into the corpus. There is a perceptible influence on its pottery of the Jhukar style of Sindh and Black and Red ware with occasional paintings in fugitive white from Gujarat (and Rajasthan). There was found a solitary vase bearing typical Cemetery 'H' influences. But the picture in the northern as well as the eastern domain of the Indus Empire remains somewhat hazy. A comparable stage is rather under finable. What we get there in the post-mature phase which can, at best, be termed as 'rural' as all the mature elements in their cultural milieu are simply conspicuous by their absence. On the whole, this phase of the culture witnessed an overall disintegration of cities and towns on one hand, and the emergence of smaller, more nebulous settlements on the other. No doubt, there should had been some serious inherent weakness in the socio-economic mechanism of the mature Harappan period that the apparently formidable urban system collapsed under its sheer weight and the society once again relapsed into its pastoral and agricultural lifestyle. May be, the excessive dependence of the Harappans on their lucrative trade with the Mesopotamian world had in it the dramatic flaw. Once that trade suddenly snapped due to the century – long political turmoil that prevailed there towards the closing centuries of the 3rd millennium, the Harappan could not stop for long their huge and complex economic superstructure from crumbling. As a natural corollary to that was the disintegration of their manufacturing and marketing forces which, in turn, might have heavily told on their cities and towns. Later, the Harappans of Gujarat perhaps made an attempt and partially succeeded for a century or more to reestablish the trade with Mesopotamia, probably through the intermediaries in Bahrain and thereabout, but could not sustain it for long. Disintegration and reversion to the ancient and most dependable occupation of agriculture and pastoralism was inevitable to follow.

The Harappans had made indeed a spectacular civilization which must have dazzled the contemporary world with whom they came in contact, and which must have bequeathed to us, the Indians, a rich intellectual legacy which needs a thorough investigation, evaluation and a proper appreciation.

NEOLITHIC SUBSTRATUM OF AFRO-ASIAN CULTURES IN THE INDUS CIVILIZATION

Dr. Syed M. Ashfaq

In order to evaluate what has been cooking in the melting pot of Culture in the Indus Valley from the dawn of human Era we have to begin somewhere in the middle to point out some of the startling similarities between the Indus and the Nile basins.

In the anecdotes of the Macedonian campaigns in South Asia, Arrian quotes Nearchus as saying that Alexander on seeing crocodiles in the river Hydaspes (Jhelum), and Egyptian beans growing on the banks of Akesines (Chenab) thought that the source of the Nile was located in the mountain ranges looming through the haze to the north of the Punjab plains. In ensuing discussions with his generals, however, he soon realized the mistake, and struck off the passage from the letter he was writing to his mother (*Anabasis*, vi, 1).

The likeness in religious outlook of the pagan Egypt and the Vedic South Asia is all the more striking in many details. Both ancient societies were votaries of phallic worship (Anonymous, 1889). The Egyptian divinities Osiris and Isis were nearly exact counterparts of the Vedic Siva (A-Surya) and Sakti (Usas or Uma). The bull was sacred to Osiris in the same way as it was to Siva, and the cow goddess Hathor was dedicated to Isis in the manner as it was to Usas or Uma (Das, 1929).

Dr. Abinas Chandra Das, quoting the anonymous author of *Phallism* mentions an interesting episode of the British campaign against the Napoleonic troops in Egypt, in which Indian mercenaries had been deployed and taken to Egypt via the Red Sea and Suez to assist in the task. The Hindu soldiers recognized many of the mythological forms, such as bulls and hooded serpents in stone on ancient religious structures. This led them to believe that Egypt must have been a Hindu dominion in the remote past. They felt hurt to notice an utter apathy of the native Muslim population towards the fine carvings fallen into decay in the apparently Siva temple at Hadja Silsili.

The similarities do not end there. A palpable link between Egypt and Sindh is expressed even in the newspaper magazine feature on Monghopir at Karachi, appearing last Sunday. The writer corroborates the results of an archaeological investigation, showing existence of a Bronze Age settlement at Monoghopir near Karachi (Hasan, 2001), where the shrine and the sanctuary for crocodile in the water pool have acquired sanctity from times immemorial. A study carried out many years back (Mahdihassan, 1973), suggests its identity with the ancient Egyptian tradition of establishing crocodilopolis around waterholes in the oases in the Nile Valley.

Perhaps, in the past ages, the lower Sindh had many other sacred sanctuaries for crocodiles, which have now disappeared. Frequency of such spots in the piedmont plains north of the Indus Delta, probably suggested to Alexander's chroniclers the toponym of Krokala for the semi-arid landscape flanking the present city of Karachi. The name Korangi may possibly be a much later offshoot of Krokala, reminiscent of the Bronze Age cult of the Egyptian crocodiles.

The crocodile known as the Makara in Vedic literature, is a symbol of prosperity and worldly bliss in Hindu art. The connotation possibly again links it with the divinity Sebek of pagan Egypt, or to some folklore of the eastern African origin. Etymologically, the Greek and the Latin terms, and the Indic Makara used for the amphibian beast are all derived from the Swahili 'makerer', as is the Sanskrit Sinha or Simha (lion) derived from the Bantu word 'Simba'. It gives us pause to think if all these Afro-Asian similarities may be mere coincidences, without any historic links down from the Bronze Age.

The import or exchange of such religious concepts and linguistic elements between the Indus Valley and Egypt or the eastern littoral of Africa indicate viable maritime links between the two widely separated cultural spheres of Afro-Asia. It must have been before discovery of any shortcut land routes between the two regions, and also long before the commercial fleets of prophet David set out from the Gulf of Aqaba to trade with Socotra, Ophir, and Konkan coasts of the Arabian Sea about the First Millennium B.C. The Roman exploits of seafaring recorded in the *Periplus of the Erythrian Sea* is definitely a very late development, and cannot be vested with responsibility of propagating such things.

Prof. S.Q.Fatimi has done invaluable service to maritime archaeology in his studies by gathering a large number of loose strings from the Vedic and Egyptian sources, to piece together the lost history of navigation between the Indus delta and the Red Sea ports of Africa in the Bronze Age (Ashfaq 1993).

His researches indicate an outcast people known as Vratyas in the Indus Valley, who mastered the art of navigation, and dominated the overseas commerce between Asia and Africa in the beginning of the Indus Civilization (Fatimi, 1989, 1991).

In Vedic sources, the seafaring Vratyas have also been called *Marutvam* or Masters of the Wind, in acknowledgement of their understanding of the seasonal reversal of the Monsoon winds, and judicious selection of time for setting sails to destinations across the Arabian Sea. They used reed rafts with sail rather than high keeled wooden boats for long journey over the open seas.

The Egyptian records speak of a sailor community, which had colonized the land of Punt, and traded with the Egyptian port towns situated on the Red Sea. The earliest recorded report of an Egyptian fleet reaching the land of Punt was in the time of Sahure (c.2488-

2475 B.C.), while Queen Hatshepsut (1501-1490 B.C.) accompanied a trading expedition to the land of Punt in her 9th regal year, which is commemorated in an inscription at Deir al-Bahri.

The location of the land of Punt has remained a riddle, but weight of opinion now tends to locate it on the coast of Sudan, somewhere south of the port of Suakin, and including the island of Dahlak in the Red Sea (Sleeswyk, 1983).

From a number of internal evidence of etymological constructions of the names and epithets employed in Deir al-Bahri inscription, the people of Punt are identified with the Vratyas or Marutvam in the Vedic accounts. For instance, the name of their chief p-r-hw (Peruhu) seems to be equivalent of the Vedic name Peruka (*Rig-Veda*, vi, 63.9), meaning a strong or formidable person (Fatimi, 1989).

The epithet employed in praise of Queen Hatshepsut is 'Makere' which recalls the Vedic crocodile symbol of Makara, the sign of suspiciousness mentioned earlier.

Punt itself appears to be derivative of the Sanskrit adjective, *Punya*, meaning pure or sacred. Hathor, the Egyptian cow goddess, is mentioned as the mistress or the presiding deity of Punt, while the *Marutvam* are named as 'Gomatra' or the sons of the cow (*Rig-Veda*, 1,85,3).

The seafaring *Marutvam* therefore, seem to qualify as the intermediaries in the exchange of the religious concepts between Egypt and the Indus Valley. They probably belonged to the earliest wave of Aryan immigrants to the land. Being aliens and in minority, they were probably pushed to areas of marginal economy. Some went towards the mountainous backyards of Hindukush valleys to live as pastorals, and later becoming known as people of Kafiristan. Others were driven towards the seacoast to pursue fishing and as sailors.

The common cultural feature of Afro-Asia seen in the Melting Pot of the Indus Valley just do not end with the enumeration of the Bronze Age and post-Harappan reminiscences. Coasts of Makran and Sindh show a significant number of Megalithic remains, varying in forms from box grave or stone-lined cists covered with capstone, to stone circles, avenues, dolmen, cromlech, and cairns (Cousens, 1929; Childe, 1947; Fairservis, 1971; Wheeler, 1947).

Study of distribution of the Megalithic monuments from Outer Hebrides in Europe to the Peninsular India suggests a vast chronological bracket from the third millennium B.C. to the third Century B.C., the date becoming later as one goes southward in Dekkan. On this generalized rule, some of the superficial studies of the Megaliths in Sindh have been dated late in post-Harappan periods. An important feature of most of the Megalithic remains in Sindh is the association of the microlithic implements found on the surface.

The microlithic tools collected clean from the sites by enthusiasts of Neolithic Age without recognizing the cultural significance of the Megalithic tumuli themselves, have done irreparable damage to evidence of antiquity of such cultural remains (Ashfaq 1995).

The microlithic tools consisting points, blades, lunates, trapeze, and other forms are prepared from jasper, chalcedony, obsidian, and other crypto-crystalline material. Very few of the artifacts seem to have been shaped out of the gray and brown chert material of Rohri and Jherrak Hills. In comparative study of these microliths in lower Sindh, it would be futile to look for their genetic prototypes in the Mesolithic blade tradition of Rohri Hill. These rather appear to claim their descent from late Caspian industry of Kenya, or the Sebilian and Magosian microlithic industry developing in Neolithic Egypt and adjoining coastal strip of the Red Sea (Hawkes, 1963).

The question arise, how these cultural elements traveled from Africa to the littoral of Baluchistan and Sindh in the remote antiquity of the Neolithic Age, before the seafaring *Marutvam* occupied the maritime stage in the heydays of the Indus Civilization ?

To get a confident answer, we have probably to wait for several decades until a systematic and integrated field research is carried out by scholars of all the domains involved.

We may, however, offer a speculation that right toward beginning of the Neolithic Age, the southwestern Asia along with the neighboring Red Sea coast of Africa experienced a devastating climatic change. The ecological balance was particularly worst affected by increasing aridity in the southern Arabian Peninsula and the Eriterian and Sudanese coasts.

This unprecedented calamity in the land of origin of the Semitic race caused their mass migration to north, south, and east by all possible land and sea routes.

Their exodus to the Mediterranean Basin, and further north and west into Europe is witnessed by the great number of megalithic burials of various descriptions and of very early dates. Some of those migrants also made their way towards Makran and the coastal Sindh, carrying their traditions of the Megalithic burials and microlithic tools in the lower Indus Valley. Among these Semitic migrants emerged a class of the earliest mariners, the Panis, spoken of disparagingly in the verses of the *Rig-Veda*, who were the predecessors of the *Marutvam* in the art of navigation.

This earliest Semitic blend in the population of the Indus Civilization probably spoke a proto-Arabic language. By virtue of their technical superiority, it looks possible that their proto-Arabic language gained acceptance and a slow domination in the Indus Civilization.

If this speculation proves true, there is ground to suggest a revival of the efforts on decipherment of the Indus Script along the pattern already set by late Abul Jalal Nadvi, an eminent scholar of Arabic and Oriental Studies (Nadvi, 1956).

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INDUS VALLEY CIVILIZATION AS VIEWED BY HISTORY

Prof. Razia Sultana

People take pride in having a glorious historical heritage that may be in terms of physical material or non-material accomplishments made by their forefathers and ancestors. Also, they are possessive about their historical heritage. The result is that they may react against individual or group that tries to undermine or damage their monuments or relics of the past. What make people react to such criticism? Why people take pride in having a flourishing past? Why are they possessive about it? These queries are invaluable. However, they seem to be natural. People are always sensitive about their origin and roots. They keep it very dear to their hearts and consider themselves custodians of the same. Resultantly, feeling possessive about them seems all right. Similarly, people of deep roots strongly embedded in their antiquity are considered of value and prestige. Therefore, mostly people take deep interest in unfolding their historical heritage. And, if it is magnificent, they make it a point to expose it to the world so that the world should look at them in the light of that past grandeur. Consequently, in the contemporary societies, people refer to their rich historical heritage so to enjoy the respect and honour offered as a result.

The question is if people do so much care and so sensitive of their historical heritage to feel distinct and different by having it, why historical heritage decay in material and non-material senses around the world. Do people mean what they say, is a relevant question. The answers in this connection are multi dimensional, because it involves a variety of people who can save these historical treasures. From specialists of this field (Archeologists and Historian) down to common man and of course the role of state functionaries cannot be ignored in this case. In fact, material or physical heritages necessitate people's attitude for its protection. Of equal importance is the availability of huge financial resources that ensure the preservation of these historical monuments for the posterity. For the preservation and proper transmission of non-material deposits to the future generations research endeavours (research program/projects) on various aspects of that can develop understanding among the people about the significance and utility of it. This is the way through which civilizations of the past can be engaged into a dialogue with the existing ones and the later can benefit from the experiences of the former. As for as the question is of whether people do what they say? The answer has the potential to generate a hot debate and may lead to indefinite speculations devoid of conclusions. However, it has been observed generally, that in most of the cases, what people say they do not enact. If that is the case, historical reservoirs can not take shape and the question of preserving them becomes irrelevant. However, on the other hand, the very presence of highly advance societies in the past ushers on the idea of specified minority and indefinite

majority. It is in fact the work of that limited minority, which make the indefinite majority develop gigantic monuments in material and philosophical terms.

There is a two pronged approach to let people understand what they are supposed to. One is through word of mouth and the other is through practical experience. However, in the presence of rich spoken and written languages, spoken word has preference as a powerful medium of expression over learning through sheer processes of experience. Therefore, discussions, debates and dialogues are in vogue in every field of knowledge and learning. Utilizing the tradition of dialogue and discussion the discourse on the preservation of the historical heritage has been revived since long and is in currency in the intellectual circles these days. Especially, the archaeologists, social scientists and anthropologists are very keen on the subject in point. That is the reason that this year " 2001 " has been declared a year of dialogue among civilizations of the world. The civilizations of the past (a heritage for the succeeding generations) are supposed to communicate with the civilizations in the contemporary world in an organic form which makes it more interesting and fruitful. This is a useful venture and will have a benefiting impact on the contemporary thought processes and will rejuvenate and reinforce the attitudes to preserve these valuable historical treasures.

WHAT IS CIVILIZATION/CULTURE?

Since the term civilization has already been introduced in the discussion, it is essential to define the concept first, because it is wide and complex. This definition will be used repeatedly in the context of this discussion. The concept, civilization, is a comparatively modern in terms of time because its genesis are imbibed in the mid 19th century intellectual debates (Britannica, 1974: 657) concerning the evolution of societies through various stages. However, before defining civilization there is another relevant term "Culture", without having a grasp of which the term civilization cannot be understood in its proper connotation. In fact, culture is more than a collection of mere isolated bits of behaviour. It is, "integrated sum total of learned behaviour traits which are manifest and shared by the members of a society" (Shahpito,1956:168) or to make it more simpler, "culture is the sum total of ways of life of a group of people" (Encyclopaedia, 1969: 942) The term "culture" seems to be of limited meaning and application in the context of progress of a society but has the potential to grow into complex whole. Once it reaches that advanced stage, it is known as "civilization".

It will not be out of context to identify a shared and known practice in connection with the definition of these two terms, "culture" and "civilization". There is no single consensus definition of the said terms by the scholars. There are as many definitions in this case as many scholars exist on the said subject around the globe. It is amazing that none of those definitions seem to be superfluous or incomplete. All of them seem to be comprehensive and relevant to the times and societies that have been reckoned with for

the said purpose. No doubt, disagreements among the scholars over such issues remain a constant phenomenon, which engender novel ideas and theories and keep the flame of innovation burning.

Let us pick the thread where it was dropped. Any discussion on civilization would definitely begin with the definition of the concept. Initially, the term was used for defining an individual's refined behaviour and well manners. A person of pleasing manners observed self-control and of gentle disposition was known as "civilized". This way the meaning and use of the term had a restricted sphere of application. Later, the term extended and grew enough to be applied to complex phenomena like defining the rise and fall of different societies or the various stages through which societies traverse in the course of evolution. The English anthropologist, E.B. Tyler, was the one who gave the classic definition of the term "civilization". He said "Civilization is that complex whole which includes knowledge, belief, art, moral, law, custom, and any other capabilities and habits acquired by man as a member of society". (Britannica, 1974:675) It can be inferred from the definition of the term civilization that it can be applied only to societies that are more massive and complex. They enjoy more mastery over the natural and human environment than other does, weaker and primitive societies do (Americano, 1987 Vol. 7:2-3). It can further be interpreted that civilizations must be relatively few as compared to thousands of societies and cultures known to social scientists. The civilization of Indus Valley is one, which blossomed during the period of 2350 to 1750 B.C. (Farman, 1977:21). Unlike the early-civilized societies of Mesopotamia, Egypt and China the very existence of an early Indus civilization was unsuspected until the advent of modern archaeology. Scientific excavations began under the British in the 20th century and the advent of radiocarbon dating techniques in the preceding years has considerably clarified the existence of the Indus Valley civilization.

WHAT IS THE CRITERION FOR CIVILIZATION?

Before delving into discussion on the value and accomplishments of Indus Valley civilization it seems essential to check the yardstick, which measures the progress of a society at the level of civilization. This very interesting argument, which again originated in the 19th century. Many archaeologists equated the dawn of civilization with the appearance of metal tools during their excavations. Others preferred to date it from the invention of writing and transition from prehistory to history. Still others argued that the combination of metallurgy, writing and large-scale building was the hallmark of civilization. (Americano, 1987, Vol. 7:2) In the 1930s, V. Gordon Childe add another factor by connecting civilization with what he called the "urban revolution". (Americano, 1987, Vol. 7:2) According to this idea, whenever man gathered into cities and began to specialize, civilization came into existence. Occupational specialization, Childe argued, led to the rapid improvement of skill, and led to the invention of better tools. The

result was a rather sudden elaboration of the material, intellectual and artistic aspects of culture to a level of complexity and refinement that deserved to be called "civilized".(Americano,1987,Vol. 7:2) Consequently, the criterion for a civilization requires, developed writing, refined metal tools, construction of massive architectural edifices and urbanization of societies.

INDUS VALLEY CIVILIZATION FROM AS VIEWD BY HISTORY

The question, does Indus Valley civilization fit in the framework set by the social scientists? Apparently it seems that, yes, Indus Valley civilization qualifies the criterion set out for such a purpose. The picture that emerges illustrates that it had an extended area under its sway, which is considered the largest occupied by any civilization of that period. There was hustle and bustle in the cities numbering around seventy having main centers of activity at two places, Moenjodaro and Harappa. Traders enjoyed strong commercial ties through river ways with Mesopotamia.(Wheeler, 1968: 81-82) Skilled peoples such as brick makers, masons, potters and toolmakers were involved in their respective businesses. Other main segments of the same society, such as priests and rulers (Raj, 1985:2-5) were busy in ensuring security, prosperity and spiritual comforts to the people. Society, being very well organized and well off gave birth to minds that laid out such unique and modern town planning that astonished the people of coming generations. Other requirements of social life were also taken care of such as the building of, Great Bath, where perhaps people could take ritualistic bath under the direction of priests. The construction of a citadel on high mound for the defence of the cities spoke of their military skills. The granaries had the capacity to store a huge amount of food grains for population is a common feature of Indus valley cities, which envisages that supply of food was under state control. Similarly, the existence of very modern facilities in-built in the city planning amaze many. There were very well laid out roads and streets, which were wide and intersected at the right angles. A well-drawn out drainage system was in place, which highlighted the strong sense of cleanliness of the dwellers. Similarly, the provision of ventilation, bath, and in some cases double storied houses show not only the prosperity of the people but high civic sense also. The bronze and clay made figurines and pictures engraved on the seals revealed interest of people in art forms. Similarly, the presence of numerous ornaments, with all their diversity, show that women of that time used to decorate them with beautiful ornaments made of different materials. The styles of clothes, which are visible on the pictorial seals and the figurines that have been found during excavation, indicated the aesthetic sense of the ladies of those days. In addition, the natural calamities coupled with the invasions of the highlander, which caused the destruction of the civilization (Raj, 1985:7), portray the dark side of the picture. Anyhow, there is a long list of such revelations and interpretations that can be given in this connection. However, this is not the whole truth about the Indus Valley civilization. Still,

there are facts, which are missing and halt the process of conjecturing up a holistic picture of the civilization.

In deed, there is a serious predicament, which block scholars and common people to understand the real worth of the civilization. That main hurdle is the decipherment of the inscriptions of the said times, which has held up the process of understanding between Indus Valley civilization and modern times. Of course, visible remnants surfaced as a result of excavations speaks loudly for the skills acquired by those people. However they fail to reveal the ideas and feelings that made them produce such works. Here comes the role of written records, which are yet in oblivion with regard to the civilization. No doubt, several attempts have been made over a period of time since the initial inscription found on seals of stone and clay at the sites of Moenjodaro and Harappa by British officials namely, Major (General) Clark, the Commissioner of Oudh and Mr. J. Harvey, Inspector of schools at Multan (Farman, 1977:12). Attempts are still underway to construe the script and read the message written therein. The brevity of the script of Indus valley writing has made it difficult to decipher. The longest inscription is composed of seventeen characters and others are not more than half a dozen, having forms of geometrical design (Wheeler, 1968:108) and pictorial signs. Anyway, the pioneer who was involved in deciphering the Indus valley writing was J.F. Fleet. Later, others for instance, G.R.H Hunter wrote a Ph.D. dissertation on the same subject in the years 1926-29.(Khan, 1973:69) However, the matter could not experience a breakthrough. No conclusive solution has been offered by a list of scholars who have been working on this area since long. Every new theory that emerges in this connection either contradicts the previous work or complicates it. Still motivated by sheer optimism, majority of foreign scholars and a bunch of indigenous ones, are involved in the process of unfolding the mystery of the Indus valley inscription which keeps social scientists hopeful that one day it will be deciphered.

The preceding argument pin on the significance of written records and does not suffice in the presence of those large number of artifacts, figurines, seals and other remnants for conveying adequate message of the said times. This situation necessitates acquiring the services of another field of knowledge to help solve the problem. That specialized field of knowledge is history in this case.

History is defined as, "an unending dialogue between the present and the past"(Gardiner, 1988:1); it is also known as the record of human past. It has its own method of viewing and analyzing different events of the past. As evident from the definition it relies much on the written record of the bygone period. Of course, for the sake of making sound analysis and to reach meaningful conclusion, it needs wide range of information. At this point, it takes help from other sources of knowledge as well such archaeology,

anthropology and geology (etc) to conjure up a complete picture of past culture and civilization. In fact, history gives meaning to those excavated objects and artifacts, which represent the mind of that particular time, which gave shape to marvelous ideas and monuments. History renders another service also that it determine the use of material and non-material achievements made by a civilization such as why the architects of Indus Valley civilization planned cities and how the dwellers utilized them for their optimal comfort. Similarly, how and on what basis the granaries (huge surplus food stores) were filled and what was the mode of collection and distribution of the food grains can be construed by history only. However, in case of Indus Valley civilization history falters because without having at hand a bulk of intelligible written documents it is disabled to render the service. Hopefully, it will not take long to decipher the writings. The job of historian will only begin after that. Anyhow, I would like to conclude this paper with a few suggestions.

SUGGESTIONS

The acknowledgement of the value of culture and civilization as an embodiment of knowledge and information makes it incumbent upon the scholars, state functionaries and even common man to preserve and utilize this common heritage of mankind. The Indus Valley civilization, which is salient component of this shared heredity, needs to be explored to the maximum in order to widen its scope for the modern times. There are a few suggestions in this regard, which are as under.

- UNESCO and Government of Pakistan with the support of other relevant organizations need to patronize those scholars who invest their time, energy and mind in the decipherment of Indus Valley inscriptions.
- Government of Pakistan should employ the services of social welfare organizations, NGO's and other interested organizations to chalk out awareness raising campaign's in order to make people conscious about the significance of their rich historical heritage and make them work for its preservation.
- The earnestly required financial assistance should be arranged in order to bolster research projects and preservation strategies on Indus Valley Civilization. In this connection beside other sources the local philanthropists can be very helpful.
- The subject of ancient civilizations should be made part of syllabi at the schools and colleges level so that the young generation benefit from the knowledge and information contained therein.

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**MATERIALS
&
TECHNOLOGY**

POTENTIAL STEATITE SOURCES FOR THE INDUS CIVILIZATION

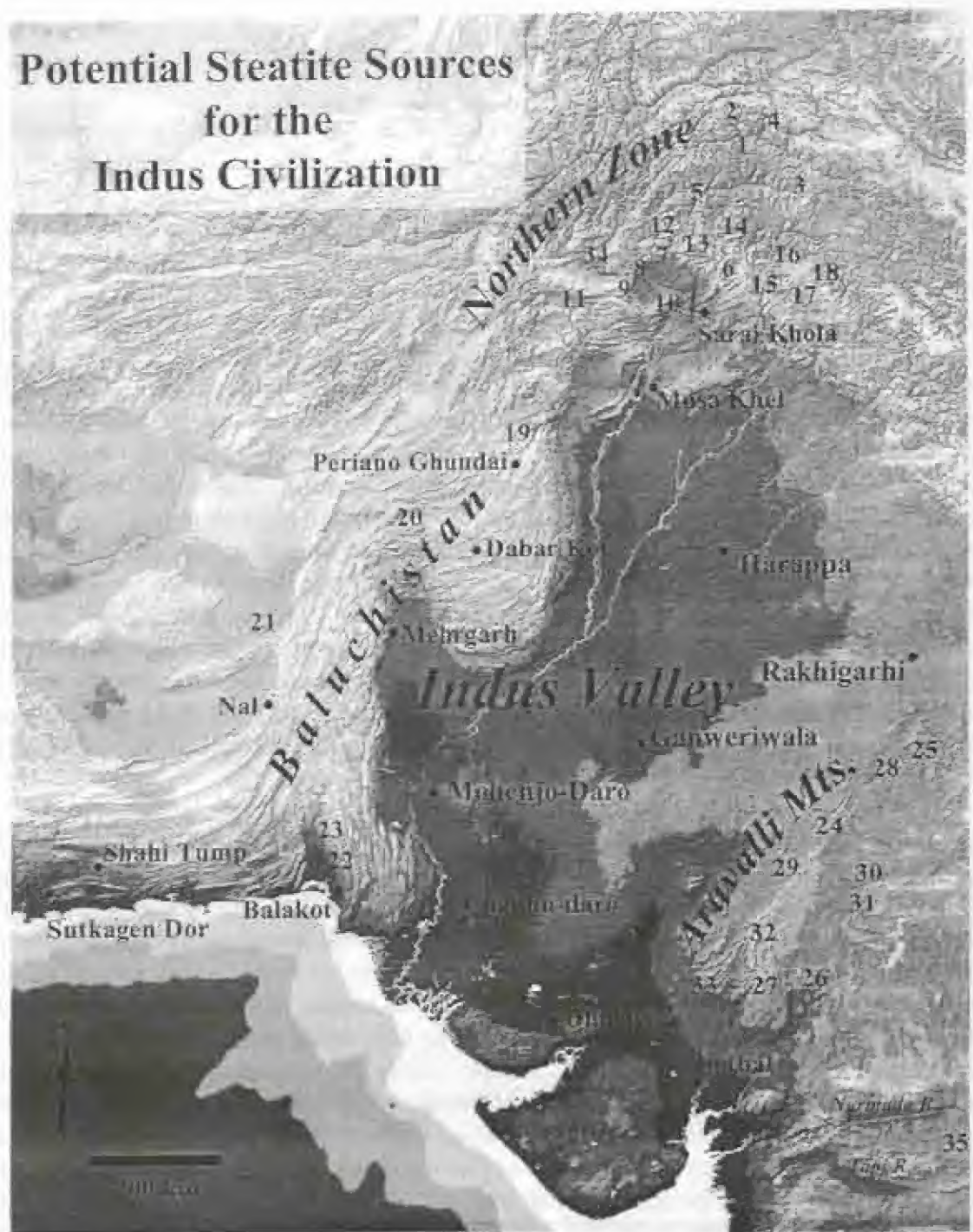
Randall Law

INTRODUCTION

Steatite (soapstone) artifacts have been found at nearly every excavated Harappan period (2600–1900 BC) site. This easily carvable material was used by Harappan craftsmen not only for the production of common items, such as ornamental disc beads, but also for the manufacture of objects with political and/or economic value such as seals and tablets. Sites where evidence of the production of finished steatite items exists include Harappa (Meadow et al. 1996:8), Mohenjo-daro (Pracchia, Tosi and Vidale 1985:234), Chanhudaro (Mackay 1943:205), and Lothal (Rao 1985:306). All of these sites are located on the alluvial plain, far away from the mountainous areas where rock of this kind occurs. Source provenance studies of steatite artifacts can allow us to reconstruct trade routes between Harappan producers-consumers on the Indus Plain and those groups, sometimes non-Harappan, from adjacent highland regions who would have been in a position to exploit and supply this important material. The initial step in such a study is to identify all potential source areas. This paper is an outline of the known steatite deposits of northwestern South Asia in regard to their geographical relationships with ancient cultures that occupied the zones where those deposits are located. Past outlines and subsequent exchange system models (Lahiri 1991) have been based mainly on the very limited and often spurious information in century-old district gazetteers compiled by British civil servants. This work, based largely on contemporary geological literature and personal observations in the field during the years 2000–2001, is an attempt to make a much more accurate and comprehensive listing of potential steatite sources for the Indus Civilization.

Steatite is a rock composed primarily of the mineral talc in its massive form, with varying quantities of other minerals including mica, chlorite, and serpentine (Read 1979:408). Talc is a secondary mineral formed by the alteration of magnesium rich-rocks primarily through heat or stress action (Deer et al. 1966:229). For this reason rocks containing it are found most commonly near plate boundaries, in ophiolite zones (areas where oceanic crust has been emplaced in a continental setting), and other regions where alteration of ultramafic igneous or dolomitic sedimentary rocks have taken place. The Indus Valley is surrounded by such zones and thus, steatite occurs at numerous locations along the region's perimeter. At different periods during its development and existence, the Harappan Civilization bordered or encompassed many of those locations. Any or all of them could potentially have been sources of this important material. For this paper I have chosen to divide these potential source areas into three main groups (Figure 1): The Northern Zone, Baluchistan, and the Aravalli Mountain Range. These divisions are for

Potential Steatite Sources for the Indus Civilization



(Figure 1)

descriptive purposes only and are not meant to reflect either any geologic or cultural unity across the regions described.

STEATITE DEPOSITS OF THE NORTHERN ZONE

In the far north of Pakistan, steatite occurs at several locations along the Main Karakorum Thrust Zone (Hussain et al. 1997). Deposits include those found in the vicinity of [1: see Figure 1] Chalt (Asad 1996:13; *personal observation*) and in the [2] Ishkoman Valley (Geological Survey of Pakistan-Quetta Museum collection; Case 22). A type of talcose stone that is used to carve bowls and drinking vessels is found both in [3] Chaproatagh Nala in Hunza and in the [4] Skardu region south of Khapalu Village near the Shyok River (*personal observation*). A small showing of steatite also occurs in the [5] Shi Valley of Chitral (Calkins et al. 1981:9; *personal observation*). Due to the remoteness of these deposits it may seem unlikely that they were sources of steatite during the Harappan Period. However, it should be remembered that rock carvings from the prehistoric period are found throughout the Upper Indus Valley region (Dani 1995). This indicates that human beings were living in or moving through this remote area (and conceivably exploiting its mineral resources) at a very early period.

Moving southward, extensive deposits of steatite occur in the Hazara District around [6] Sherwan (Ali et al. 1964:29-34; *personal observation*). Small showings are also found along the margins of the Peshawar Valley at [7] Utman Khel [8] Jamrud, [9] Landi Kotal, and [10] Kund (Ali 1959; Rafiq 1984:58; *personal observations*). Extremely large deposits are found in the Safed Koh Mountains in the vicinity of [11] Parachinar (Meissner et al. 1975:18, Badshah 1983; *personal observation*). Steatite mineralization occurs in the [12] Bajaur region (Kazmi and Jan 1997:310) and pockets of are also reportedly found in the talcose schists of the [13] Swat Valley (R.D. Lawrence 2001: *personal communication*). Various ultramafic bodies east of the Shangla Pass have been altered to talc (Kazmi and Jan 1997:312) and are visible in a dozen or more outcrops in the vicinity [14] Derai, Besham and Batl (*personal observations*). Harappans could have accessed all of these sources through interaction with prehistoric cultures known to have inhabited this part of Northern Pakistan (Stacul 1994). The site of Sarai Khola represent the northernmost known extent of the Early Harappan (Kot Dijian) culture and is located along the natural route south from the Hazara region and east from the Peshawar Basin and Swat Valley (Halim 1972). At Ghalegay rock shelter in Swat wheel-turned, black on red style, pottery was found that suggested Early Harappan period connections with groups in this region (Khan 1991:35). It should also be noted that the most direct route to the Mature Harappan site of Shortughai, located in the far north of Afghanistan (Frankfort 1984), was through this northern zone. It is therefore not inconceivable that steatite used in the Indus Valley during both the Early and Mature Harappan Periods was obtained from this region.

Moving eastward, there are numerous steatite deposits located in the Kashmir region. Outcrops are found in the vicinity of [15] Kolti (Ahmed 1981), [16] Nauseri (Ahmed 1969:154), and in the [17] Raisi and [18] Udhampur districts (Government of India 1985:33). Prehistoric Kashmir was occupied by a distinctive highland culture characterized by pit-house dwellings, handmade pottery, and dog burials (Fairervis 1975: 312-317). However, examples of Early Harappan (Kot Diji type) pottery and carnelian beads found at the site indicate that these mountain valley dwellers had some degree of contact with more complex plains cultures to the south (IAR 1964-65:13). Kashmir steatite might have made its way down into Indus Valley through interaction with places such as Ropar, a Harappan period settlement located the near point where the Sutlej River leaves the Himalayas for the Punjab Plains (Possehl 1999: 552).

STEATITE DEPOSITS OF BALUCHISTAN

The known steatite deposits of Baluchistan are widely separated but highly significant in terms of their association near or within documented archaeological complexes that would allow material from them to be easily exploited and distributed.

In northern Baluchistan steatite has been reported in the Zhob ophiolite zone at two locations [19] north of Fort Sandmen (Ahmad 1975:135). In this same area lies the site of Periano Ghundai, first excavated by Sir Aurel Stein in 1927 (1929:37). Materials from here belonging to both the Early and Mature Harappan periods were later by identified by Mughal (1972:140-142). If steatite was obtained from this region it would likely have been moved north along the Zhob and Gomal Rivers to other Harappan sites on the Gomal Plain and beyond. The [20] Muslimbagh Ophiolite Zone, located in the southern Zhob District, and contains numerous steatite deposits (Ahmad 1969; Figure 30; *personal observations*) and sits near what was a major prehistoric crossroads and area of continuous settlement since Neolithic times. Steatite from Muslimbagh could have easily been traded south into the Loralai Valley and the Harappan site of Dabar Kot, or west to the Quetta-Pishan region and from there to the Indus Valley sites via the Bolan Pass. Approximately 100 km south of the Quetta-Pishan Valleys [21] a showing of gray steatite has also been reported near Chuttok (Tariq et al. 1998: 16).

In southern Baluchistan, the extensive ophiolite zone of the Las Bela and Jhalawan districts lies in an area that was encompassed by settlements belonging first to the Early Harappan Amri-Nal phase and later by those the Kulli-Harappan complex. That this area might have been important source of steatite during those periods is indicated by the well-known distribution center of this material presently located at the pilgrimage site of Shah Noorani (Vidale and Shar1990). *Johris* (small-scale ornamental stone cutters and merchants) from throughout Pakistan regularly visit the shrine, located in the southern Pab Range, to replenish their *zahr muhra* (steatite) stocks. The actual sources of this

steatite are several outcrops, in the vicinity of [22] Wayaro, within the extensive Las Bela ophiolite that make up the eastern slope of the Mor Range (*personal observation*). From Shah Noorani, passes across Pab and Mor Ranges and trails through the Kanrach Valley lead directly to these sources. A small showing of talc west of [23] Kanar is noted in the geologic literature (Fariduddin and Pasha 1988: 16) suggesting that other sources may be present in the Las Bela ophiolite as it continues north.

STEATITE DEPOSITS OF THE ARAVALLI MOUNTAIN RANGE

Deposits of steatite are found throughout the length of the Aravalli Mountain Range of western India. In Rajasthan alone, outcrops are found along nine well-defined belts running through the districts of [24] Ajmer, [25] Alwar, [26] Banswara, [27] Dungarpur, [28] Jaipur, [29] Jodhpur, [30] Sawai, [31] Madhopur, and [32] Udaipur (Gahlot and Shukla 2000:113; *personal observations*). Deposits can also be found in the former [33] Idhar State (Middlemiss 1911:52), now part of northern Gujarat. Although in hand specimen Rajasthanian steatite is highly variable, many varieties, particularly those from deposits south and east of Udaipur, do visually resemble raw steatite recovered during recent excavations at the site of Harappa (*personal observations*).

During the Early and Mature Harappan periods, Aravalli steatite could have been obtained from cultures inhabiting both the northern and southern margins of this range. Directly north of the Aravallis, steatite artifacts are present in Early Harappan (Sothi-Siswal Phase) and Mature Harappan sites in the eastern Punjab/Haryana region (Lahiri 1991:41, 96-97). During this period, inhabitants of sites making up the Ganeshwar-Jodhpura cultural complex of northern Rajasthan (Agrawala 1982) would have been in the position to supply steatite to Harappan consumers. South of the Aravalli Range steatite artifacts are found at Early (Amri-Nal Phase) and Mature Harappan period sites in Gujarat (Lahiri 1991:45, 100-102). Interaction with peoples belonging to the Ahar culture (Allchin and Allchin 1982: 262) of southern Rajasthan, via hunter-gatherers of the north Gujarat plain (Possehl 1980:73), might have provided the necessary links for steatite to enter this region.

OTHER POTENTIAL SOURCE AREAS IN SOUTH ASIA

Afghanistan and peninsular India, although remote, are also potential source areas that deserve mention. The [34] Afghanistan deposits geologically resemble those described in the Northern Zone and Baluchistan, and tend to be located near the modern border with Pakistan (Shroder 1984:93; Bowersox and Chamberlain 1995:203). One needs only to consider the remoteness of the Sar-i-sang mines in Northern Afghanistan, the nearest confirmed deposits of lapis lazuli to the Indus Valley, for evidence that minerals from this region were being exploited during the prehistoric period. Steatite from highland

Afghanistan might have been obtained via the same interaction networks through which that distinctive ornamental stone was traded to Harappan sites. Similarly, long-distance interaction with the Neolithic and Chalcolithic cultures of the Narmada and Tapi river valleys could have provided the southernmost Harappan region access to remote steatite sources in [35] interior peninsular India (Krishnan 1982:161). Massive fuschite (aventurine quartz), of the type found at Moenjo-Daro in the form of a tumbler (Mackay 1938:320), occurs far to the southeast of the Indus region in the Bellary District of present day Karnataka (Brown 1955:300). It is not unreasonable to assume that steatite could have also found its way to Harappan sites from similarly distant regions of central India.

CONCLUSION

Harappan consumers could have potentially obtained steatite from any of the sources discussed above. A.H. Dani has suggested (1991:111) that the prehistoric cultures of the Northern Areas exploited their mineral resources at a very early period for trade with their neighbors to the south. The steatite deposits of Northern Baluchistan are located nearby major prehistoric crossroads and trade routes while those of Southern Baluchistan were within areas occupied by both Early and Mature Harappan peoples. R.C. Agrawala has argued (1984:157-62) that the Aravallis Mountains were a major source of Harappan copper so it possible that the non-Harappan cultures occupying this mineral-rich zone traded steatite in tandem with that important resource. Deposits in Afghanistan and Central India, while more remote, should also be regarded as possible source areas considering other rocks and minerals found at some Harappan sites, such as lapis lazuli and fuchsite, would appear to have originated from those regions.

It will be difficult to determine the exact nature of the relationship between highland and lowland peoples of the greater Indus Valley until we have better understanding into which areas were involved with one another and when. While the presence of steatite at a Harappan site in the Indus Valley does prove that, at some point in time, the material was physically moved from its highland source to its present location, numerous questions remain including (1) which sources were used and when, (2) what groups had access to those sources, (3) how and by what route was it transported, and (4) how was the system of exchange organized? Provenance studies comparing raw samples from source areas with excavated steatite objects and manufacturing debris will allow us to address these questions. A combination of visual identification (Moffet and Butler 1986:114) and geochemical analysis (Truncer et al. 1998) of steatite artifacts is the best method to determine which source areas were utilized. A study, presently in the planning stages, of steatite artifacts spanning all five of the occupational phases at Harappa will provide detailed information into that lowland urban center's connections with highland societies and how they might have changed through time. It is expected that steatite from

each of the major zones described above will be found to have been traded to Harappa at one point or another during its long occupation. With the information provided by such a study in hand, questions regarding transport, trade routes, and, ultimately, interaction between prehistoric highland and lowland societies can be addressed in the most accurate manner possible.

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ADVANCEMENT OF TECHNOLOGICAL ACTIVITIES IN INDUS VALLEY CIVILIZATION, AN ANALYTICAL STUDY

Tahir Saeed, Syed Mahmood-ul-Hassan

THE INDUS LAND

The ancient Indus and Saraswati Rivers provided the cities with life-giving water that ensured bountiful harvests, rich riverine resources and essential communication routes. These two mighty rivers and their tributaries linked the largest cities with smaller regional towns and distant resource areas, both coastal and inland. Unlike most Mesopotamian city-states, which remained focused on the lands directly watered by the rivers, the Indus cities also extended their direct control to the adjacent regions that were rich in such resources as copper, semiprecious stones and minerals as well as timber (Kenoyer, 1998:2).

The metal was sufficiently abundant for the manufacture not merely of tools but also of vessels of various kinds. For instance, silver was used for the manufacture of vessels and ornaments and separated from lead, which is also found occasionally in the form of small dishes or plumb-bobs or merely as ingots. Other materials used for ornamental purposes by the Harappan include lapis lazuli, turquoise, jade and amazonite. Though the seal intaglios of the Indus Civilization are in a class of their own, the general range of Harappan artistry is not comparable with that of contemporary civilizations of Mesopotamia and Egypt (Wheeler, 1953:58-64)

The Craft specialization that began during the preceding period 3500 to 2600 BC became more complex as the urban workshops developed new technological processes using new varieties and combinations of raw materials. The systematic archaeological excavations in big cities of Indus Valley have revealed that these people were not only good town-planners and agriculturists but were also good craftsmen. Their skill is very well demonstrated in the making of seals, bronze material, toys, implements, jewelry etc.

The ceramic production, stone tool manufacture and metallurgy are found in most settlements because pottery vessels were necessary for the everyday activities of food storage whereas tools and weapons were needed for framing, hunting and self-defence. The preliminary stages of other crafts were practiced pre dominantly at settlements near the source of specific raw materials. Shell was produced on the coastal areas, and copper was mined and smelted in the remote regions near copper ores. The partly processed raw materials such as shell, agate, steatite and copper were transported to the large urban centers where they were then manufactured into ornaments, tools or ritual objects.

Similarly by bringing partly processed raw material to the urban workshops, the rulers and merchants of the Indus Cities were able to control the production of specific items that were used in important rituals or to define status. The control of specialized crafts became an important strategy in supporting the state and maintaining the social and ritual order. There were four major categories of crafts that were practiced in the large Indus cities, (a) Crafts processing locally available materials using relatively simple technologies, which include woodworking, basket making, simple weaving, terracotta ceramic production and house building. (b) Crafts using imported materials with relatively simple technologies, which include stone shaping for domestic purposes, and chipped stone tool making. (c) Crafts using local materials and complex technologies and production processes, which include stoneware, bangles manufacture, inlaid woodwork production and construction of decorative architecture. (d) Crafts using imported materials and highly complex technologies which include agate bead manufacture, seal production, copper bronze metal working, stone carving, precious metalworking, shell working and faience manufacture. Crafts using local materials and simple technologies are the most varied throughout the Indus Valley, while crafts using non-local materials and highly complex technologies are the most standardized.

COPPER BRONZE & GOLD TECHNOLOGY

The copper & bronze metallurgy depends on materials that originate far from the alluvial plains and the Indus cities. Smelting of copper took place in the distant highland mining regions of Baluchistan, the mountains of Rajasthan or even far-off Oman. The traders or nomads would have brought the distinctive bun shaped ingots of smelting copper, along with tin, lead and other metals to the skilled metalworkers in the city workshops. Many of the metal workshops were probably located along the edges of the settlement or in separate craft villages such as Chanhudaro where copper working and lapidary art were practiced along side ceramic production, shell working and possibly even seal making.

The crude copper or refined copper was used to make a variety of tools and ornaments used in the Indus cities, while copper alloyed with arsenic or tin was produced for specific objects. The arsenical copper makes extremely hardedge tools, such as saws or chisels. Because of the presumed high value of metal tools and ornaments it is likely that the production and distribution of metal objects was closely monitored by the ruling elite and merchants. This could have been accomplished most effectively by dividing the labour into distinct stages that could be organized and controlled by a single merchant or head artisan. Similarly finished metal objects were important symbols of wealth and power in the Indus cities and monitoring their production would have been needed to avoid pilfering of raw materials or theft of the finished objects. Merchants often hid their stocks of raw materials and finished objects by burying them under the floor. The best-preserved metal objects found in the Indus cities have come from such hoards, buried in

the house of a merchant or wealthy citizen who never returned to collect the treasure. One example of such hoard from Harappa consists of a large cooking pot. In this pot were found numerous copper weapons and tools.



STONEWARE AND FAIENCE TECHNOLOGY

In Indus Valley the stoneware bangles as important symbols of power inscribed with the names or titles of elite's were used by the elite only in the large urban centers. The manufacturing of stone ware bangles in closed saggars involved highly advanced knowledge and experience of controlled firing (Halim & Vidale, 1984). The Harappan had acquired complete mastery over this technique.

The glazed faience also may have been a valuable material that was produced in specialized workshops but unlike stoneware it was available to a wider public and was traded throughout the Indus region.

The carved wooden moulds were probably used to make ornaments and pendants in the shape of squirrels or monkeys. Small perfume or unguent jars were made by forming the fine paste over a fabric core. A variety of ornaments and beads were made by hand modeling with different colors to imitate natural turquoise, bleached carnelian or banded

agate. Because of the fine paste and resulting compact glassy matrix, Indus faience was strong enough to be made into bangles that were incised or carved with various designs. Although many cultures produced faience ornaments, only Indus faience was strong enough to produce thin bangles. Both stoneware and faience bangles were symbols of status in the Indus cities. However, the stoneware technology was lost at the end of the Indus cities. But compact glassy faience bangles continued to be made in later times and many have been the foundation for the glass technology that appeared first during the late Harappan period.

Artisans continued to manufacture faience, but alongside this technique a vigorous glass technology developed for the production of multi coloured bangles, beads, ear discs, seals and containers. The knowledge of glassmaking rapidly spread and glass beads and bangles were produced at many sites throughout the sub-continent during the 1st Millennium BC.

Similarly the use of marine shell in the manufacture of ornaments and ritual object provides one of the most striking examples of continuity between the Indus cities and later cultures in South-Asia. The upper class owned precious metals, stone ornaments and rare materials whereas the common people made do with imitations in terracotta, faience and glass etc.

BEAD MAKING TECHNOLOGY

Bead making was not unique to the Indus cities but the techniques for drilling long carnelian beads with constructed cylindrical drills was exclusively an Indus phenomenon. The basic technologies of heating stones to make them flake – able or to change their colour must be credited to the Indus artisans.

CERAMIC TECHNOLOGY

The ceramic technology played an integral role in many aspect of Indus urban society. Fired bricks were used in wells, drains and architecture, along with terracotta tiles, pipes and channel spouts. Since most settlements of the Indus civilization were located on the alluvial plains, clay was locally available.

The pottery production was a specialized craft, the absence of sealing or graffiti indicates that the ruling elite of the large cities did not directly control it. The pottery kilns have been found at Moenjodaro, Harappa, Chanhudaro and Naushero. Although some pottery making took place in widely dispersed localities, a series of pottery kilns on the northwestern corner of Mound E at Harappa demonstrates that pottery was made in a segregated area of the city. Beginning in the late Kot Diji Phase (Ca. 2800 B.C.) and

continuing through the Harappan Phase (2600-1900 B.C.) these potters' workshops remained in the same locality for hundreds of years.

The painted pottery of the Indus cities was covered with a red slip and then painted with black designs, but some large storage vessels were covered on both the exterior and interior with a black slip. Around 2600 B.C. the style of painted designs included floral and geometric motifs arranged in panels beginning at the rim and extending to the lower body of the vessel. A number of these painted designs such as the pipal leaf, the fish-scale design and intersecting-circle motifs have roots in earlier regional cultures (3300-2600B.C.) but the combination of various motifs and the style of decoration reflects a new synthesis characteristic of the Indus cities.

The recent studies of painted pottery from Harappa and the smaller regional site of Naushero show that painted designs and styles of pottery changed significantly during the Harappan Phase. These changes were not uniform throughout the Indus valley but reflect regional patterns of cultural development that took place at different times in the Indus cities. As the painted pottery takes longer to produce and the painted designs have specific social and ritual symbolism, the transition from highly decorated to less decorated pottery probably reflects important changes in economic, social and ritual organization of the Indus cities. (Kenoyer, 1998).



The Harappan pottery shows highly developed technique as is evident from the varied shapes, some of which are comparable with the pottery of the neighbouring countries of Iran and Turkey. (Khan, 1962:19).

METAL TECHNOLOGY

The copper and bronze vessels, which would have been used only by the most wealthy and powerful classes, were usually made in the same style as terracotta vessels, except where the differences in raw material made it impractical. For example wide plates of bronze usually had vertical sides with simple rims, rather than the bilaterally projecting rim found on terracotta plates. Metal containers were however much more durable than terracotta and may have been passed on from one generation to the next as objects of wealth but because they could be recycled into other objects relatively few have been recovered.

Many copper/bronze containers were probably melted down to make ornaments or tools. Although no gold vessels have been discovered, the overall ranking of raw materials from undecorated pottery to precious metals indicates that cooking and serving vessels may have been used to define social and economic status in much the same way as ornaments.

The distinctive cooking pots of the Harappan Phase evolved from earlier Amrian and Kot Dijian styles and gradually spread to all of the Indus settlements. Cooking pots were made in sizes that range from miniatures used as toys to extremely large vessels that may have been used for cooking community feasts (Kenoyer, 1998:154).

The acquaintance of the people of the Indus Valley Civilization seems to have been limited to copper gold and silver.

Copper smelting furnaces occur in quite a large number near the sites of Harappa Culture. These sites have been discovered at Balakot in Las Bela and in the Hakra Valley in the Cholistan desert of Bahawalpur. The nearest source of copper is outside the Indus alluvial plain in the Rajputana region of India or in Chagai district of Baluchistan. The copper furnaces show a profusion of slag material scattered around (Shaikh & Ashfaq, 1981:25)

According to Dr. M.R. Mughal some settlements in Cholistan were internally differentiated for various activities involving manufacture of beads of semi precious stones, copper bronze tools, items of shell and pottery as attested by presence of waste material and kilns. The mass production of pottery, the standardized form and distribution over the Indus Valley also demonstrates high level of specialization and intensive interaction among the populations (Mughal, 1991:225).

Dr. G. F. Dales, says that the making of fiancée jewelry and bangles reached a stage of technically superior to that of in Egypt, where the manufacturing technique was originally developed some two thousand years earlier Miniaturization, a characteristic feature of a Harappan art and crafts, relied again on a highly developed technical base that allowed the craftsman to focus on the artistic fashioning of the pieces rather than having to worry out the technical and mechanical aspect of the manufacturing processes (Dales, 1991:133)

CONCLUSION

The remarkable discovery of the Indus Civilization in 1922 brought the Indus land at par with Egypt and Mesopotamia as they all contributed to the development of the oldest civilized world some 5000 years ago. The pyramids of Egypt and the Ziggurats of Mesopotamia have their distinguishing features, whereas the Indus land is proud of its great Urban Centers discovered at Harappa, Moenjodaro, Lothal, Kalibangan and Dholavira.

The long history of archaeological excavations at the different sites of Indus Valley as well as new scientific investigations has added more detail to the picture of this society. In other words the picture of Indus valley civilization as presented to us through many years of excavations is that of a highly disciplined society, possessing sufficient economic wealth to mobilize labour and to support full-time craftsmanship. It also possessed resources to engage in long distance trade or exchange of products. The existence of inter related but highly developed socio political and religious institutions as reflected through their well planed cities, public buildings, large fortifications, granaries and standardization of material equipment through mass production is very much evident.

The excavations in big cities of Indus Valley had revealed ancient cities of vast proportions, with unique artifacts and a level of architectural planning that was unparalleled in the ancient world. The elaborated painted pottery (decorated with different designs) is very different from historical period. The steatite seals are marvel of this civilization, which flourished about one thousand years during 2750 – 1750 BC and disappeared from the screen of the history. The hard-fired stoneware bangles glazed ornaments and bronze tools revealed the technical skills of the Indus artisans in transforming common materials into objects of beauty or utility. Despite of these researches even today many aspects of Indus technology are not fully understood. A little has been done and a lot is to be done.

Scholars have made comparisons and contrasts between the Indus cities and later urban cultures. The transitions between the two early urban civilizations claim that there was no

significant break. The technological transformations in the different fields is however, very much clear from the material discovered from these sites. For instance copper metallurgy of the early historic period built on the earlier technical expertise of Indus artisans and their descendants who may have formed specialized occupational communities that continued to smelt and process copper ores.

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THE PROTO-HISTORIC COLLECTION IN SIR SAHIBZADA ABDUL QAYYUM MUSEUM OF ARCHAEOLOGY AND ETHNOLOGY, UNIVERSITY OF PESHAWAR.

Shah Nazar Khan, Amanullah

If we choose to regard the Indus Civilization as a melting pot, that is, a mixture of ancient people and their material culture, then the Proto-Historic peoples of the NWFP were important ingredients in it. The Sir Sahibzada Abdul Qayyum Museum of Archaeology and Ethnology at the University of Peshawar was opened to the public in 1998. Funds for construction of the Museum were provided first by a grant from the Provincial Department of Education and then by the University Grants Commission. The building is a thoroughly modern facility with new cases and a lighting system in the main display area that were provided through a Japanese Government Cultural Grant. In addition to administrative offices and storage space, the museum's other facilities include the Farzand Durrani Auditorium for lectures and conferences, and a large reception room. The Department of Archaeology's library is also housed in the building so that students/scholars may be able to see first hand archaeological materials that they are reading about. The museum's collection includes antiquities from all periods mostly of the North-West Frontier Provinces' (NWFP) history. However, in this paper I would like to call your attention to a particularly rich part of the Province's past and the museum's collection: that of the Proto-Historic Period and also to highlight the rise and fall of the Indus Valley Civilization.

Any understanding of the dynamic phenomenon that was the Indus Valley Civilization would be incomplete without reference to the Proto-Historic Period of the NWFP. From this region came many important elements of material culture and iconography that would later be incorporated into that of the urban phase of the Indus Valley Civilization – the Mature Harappan Period. For nearly four decades the faculty at the Department of Archaeology, University of Peshawar have been instrumental in bringing this fact to the world's attention.

The cases displaying stone tools illustrate both the chronology of technological innovation and the pace that it spread across vast regions. These tools also provide examples of the raw material types that both originated in the NWFP (steatite and certain types of chert) and those were traded into the region via long distance interaction with other Indus peoples (lapis lazuli from Afghanistan or carnelian from Gujrat). Cultural variability between regions can be seen in the cases that display pottery from sites with different vessel forms and the iconography painted upon the. Small finds on display show how Indus Civilization craftsmen were not only adept in the manufacture of common ornaments, such as steatite disc beads, but also of items with significant economic and/or

political value such as tablets and seals. The figurine display provides insight into both the dress and religious beliefs of ancient peoples in the region. Finally, a display case containing reproductions of artifacts from sites outside the NWFP helps people to understand the Museum's collection in the context of the greater Indus Valley Civilization.

Professor Dr. Ahmad Hasan Dani founded the Department of Archaeology, University of Peshawar in 1962. Under his dynamic leadership the department, besides developing into the premier archaeological teaching program in Pakistan, became decidedly involved in research and excavation. Standing out among Dr. Dani's many accomplishments during his tenure at the Department were his excavations at Gumla Hathala (Dani, 1970-I). Prof. Dr. Farzand Ali Durrani, three time chair of the Department of Archaeology and founder of the Museum, tirelessly worked to expand our knowledge of the Proto-Historic period. Under his guidance the excavations at Rehman Dheri on the Gomal Valley revealed that the development of a site where large-scale civic planning apparently antedated that of Harappa and Moenjodaro (Durrani 1988).

In the Bannu Basin, the work of Prof. Farid Khan and his numerous collaborators has over many years helped to clearly define a cultural sequence for that region that extends back to the fifth millennium BC (Khan et al 2000). The culture represented by the site of Sheri Khan Tarakai appears to have affinities with cultures west and north in Iran and Central Asia.

Prof. Dr. Abdur Rehman has also brought to light Jandi Babar a new cultural horizon in Indus Valley Culture at NWFP (Rehman, 1997).

Present faculty members of the Department of Archaeology, University of Peshawar have continued to pursue the exploration/excavations of the Proto-Historic period in the NWFP. Recent work is focused on the site of Jandi Babar in the Gomal Valley. The site is of the same period as Sheri KhanTarakai and deeply stratified indicating a considerable period of occupation (Swati and Taj Ali 1998).

COLLECTION

The museum collections (on display) basically consist of the cultural material, recovered through the field oriented research of the Department of Archaeology, University of Peshawar. Since its inception, in 1962 (through projects, it carried out independently and in collaboration with the Federal Government, Department of Archaeology and Museums and in few cases, jointly with foreign institutions).

As for Proto-historic period objects and artifacts are concerned, these are related, to both the rise and fall of the Indus Civilization. If we choose to regard the Indus Valley as a melting pot of cultures and civilizations, the proto-historic people of NWFP and Baluchistan are very prominent ingredients of that melting pot. For, the two regions are natural corridors, with passes that facilitated the passage of; (a) trading caravans; (b) the invading armies and (c) the population movements, since antiquity.

Among the proto-historic material pointing to the evolutions of the Indus civilization the most important site in the NWFP is that of Rehman Dheri in the Gomal Plain, in terms of town planning and material culture etc. A glimpse of its aerial photograph, suggest population nucleation in a large space available with a tendency of town planning as witnessed at Moenjodaro, but it indicates a tendency towards a town planning, seven hundred years before it. The socio-cultural process, initiated at Rehman Dehri perhaps climaxed at Moenjodaro (in the chronological framework that would equate it with that of Jamdte-Nasr in Mesopotamia).

Other important evidence is the (perhaps the earliest) squarish seal in South Asia, with animals and pictographs, which along with similar symbols scratched/carved on the ceramics can be considered the beginning of writing in Indus Valley. So we have a site in the NWFP that along with Kot Diji and Amri in Sindh, some famous sites in Baluchistan. Serai Khola and the early levels at Harappa in the Punjab along with Kalibangan in Rajasthan, India fully substantiate the indigenous development of the Indus Civilization. The ceramic complex from Rehman Dehri, like some sites in Baluchistan (and further West), reflecting strong heterogeneity, yet the beginning of Indus traditions. Among these are the famous pipal leaf, the peacock design along with horned animals, scorpions and moltese crosses along with the famous flanged rim, jars and dishes on stand are worth mentioning. Also perhaps the Indus fish scales originated/derived from, the beautifully painted fish bowls from Rehman Dehri and Lewan in the Bannu basin. Also from Lewan comes a large sized bowl painted with horned animals like a bull, a mountain goat and a buffalo, shown with pipal leafs sprouting from their horns. All these symbols seems to have played an important role in the Indian iconography and the bowl from Lewan suggest the beginning of Indus Mythology. Also, interesting are the bowls with knobs ('Wheeler's Knob and Enbarboutin') found in the early centuries of the 3rd millennium B.C. at Moenjodaro (early levels) and elsewhere in Mesopotamia (Wheeler, 1968). In terms of terracotta art (beside, ceramic technology which was extremely rich, heterogeneous both in types and forms and painted designs etc.), we have a variety of terracotta figurine (all females) that can be compared with those found in contemporary sites found in the subcontinent, Iran and Central Asia. These basically are of the following types:-

- An elegantly produced with folded arms holding vessels and applied hair style and provided with below the round waste ending with a pointing flat base (first recovered from Gumla in the Gomai Plain).
- With up stretched, short arms, and prominent breast with entire body below the waste providing the pedestal with both legs joined together.
- In this type figurine have been shown with swinging legs similar to those recovered from Namaz-Gah tepe and other sites in Central Asia.

Earnest Mackey recovered similar (type I & II) terracotta from the lowest levels at Moenjodaro. Similar Terracotta's have been reported from the early levels at Harappa. Thus, Rehman Dehri in the Gomai Plain yield material culture, related to the evolution of the Indus Civilization.

LATE BRONZE AND EARLY IRON AGE COLLECTIONS

The museum also have a vast collection from the burials of late Bronze and early iron age periods (1800 B.C. 8th century B.C.) from a number of sites in Dir and lower Swat valley. These graves (Dani's 1967) are related to the period when the urban system had broken down in the Indus Valley and cities (Moenjodaro and Harappa in Sindh and lower Punjab) were abandoned. They basically suggests the arrival into the northern valleys of the Indo-Aryan tribes in the Indus Valley (Modern Pakistan).

As attested by the exposure of these burials, they practiced mainly three types of disposal of the dead:

- Inhumation, when complete body was placed in the grave in flexed position (legs pulled towards the back and hands raised towards the face), with baked clay vessels (consisting of drinking cups and vases in Grey and Red ware along with dishes and bowls) around the skeleton. The deceased were facing southeast (in case of male) and to northwest (in case of female).
- Cremation: When the body was disposed off through fire and then the burnt bones and ashes were preserved in medium and large sized jars (in some cases with lids) along with the burial jars a variety of vessels were preserved.
- Fractional Burials: In this case after the dead body would first be exposed in the open, for some days and when the flesh would be rented by birds and animals, then the skeletal remains would normally, be collected and placed in the grave (sometime in the anatomical position and some time just piled up in a corner of the burial chamber).

Although, the funerary goods in types and forms appears to be homogenous. There are some variations as noted by the excavators. In general the baked clay vessels both in Grey and Red ware are plain perhaps in the late Iron Age (only in few cases) there appears to be some tendency to decorate these pots. In two cases a combination of black and red ware is used.

In terms of metal objects, copper and bronze needles and pins with mushroom tops and in one case a pin with a blade and hook ends is also attested. Among iron objects, a short dagger and a horse cheek bar are worth mentioning.

Beside, ornaments such as beads, finger and earrings in copper and rarely in gold also occur. In one case a young lady was found grasping a copper bowl with lots of beads of precious and semi precious stones.

In the terracotta, female figurines produced in rough and some time decorated with lines scratched across the front body also occur. In one case, a female figurine was found on the abdomen of a lady, that it probably was used for the fertility cult. However, (not in our excavation) but those of Italian mission, complete terracotta figurine in elegant fashion were found. Which are comparable to similar terracotta found in the Caspian region.

In general, material culture from the cemeteries exposed by the archaeologist from Peshawar-University at Temirgara and Thana, by the Federal Department at Zareef Korona, nine miles north of Peshawar and the Italian Mission working in upper Swat, Kohistan and Chitral etc. can be compared with those from several sites in northern Iran and Central Asia.

As such it suggest the movement of nomadic tribes, suggesting a cultural diffusion from the Caspian's to the Indus, in the final stages, after the abandonment of Harappa and Moenjodaro.

Thus, the Sir Sahibzada Abdul Qayyum Museum at Peshawar University is a repository of cultural material mostly related to NWFP and also to the rise and fall of the Indus Valley Civilization.

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**CHRONOLOGY
&
LANGUAGE**

DATE OF INDUS CIVILIZATION

Hideo Kondo

During the last 30 years, there has been major advancement in the study of Indus Civilization. For instance, the result of the excavation at Mehrgarh by French Archaeological Mission, since early eighties, have made clear that there are long cultural tradition from beginning of early farming culture to birth of civilization in Indus valley. On the other hand, American Mission working at Harappa, since late eighties, has brought to light the existence of Ravi Culture (early Harappan), some aspects of mature Indus city, and of late Harappan culture (Cemetery H. Culture) in Punjab. Moreover, Archaeological Survey of India excavating at Dholvira in Kutch, has demonstrated the presence of most characteristic form of Indus city and unbroken long cultural sequences from pre/early Harappan to Late and post Harappan Culture, same as Harappa. Still more, Dr. M.R. Mughal and others have been conducting research in Cholistan region of Pakistan and emphasizing on the importance of Gakkar-Hakra ancient river valley for better understanding of the origin and the end Indus Valley Civilization. The combined results of these researches show that the unchanged fertile environment of Indus valley greatly helped in the early growth of cultural and material development. And all different related aspects have been unfolded to present a clear picture of the Indus Valley Civilization.

With such results and advance stages of knowledge, an exhibition of Indus Valley material was held in Japan for 8 months from August 2000 to March 2001. For this special exhibition, the Excavation Branch of the Department of Archaeology, Pakistan, Archaeological Survey of India and British Museum, London very kindly spared a total number of 838 outstanding objects from their collections. The exhibition was a great success. Over five million interested people belonging to different walks of life visited this special exhibition of Indus Valley material. We are very proud of the success of this exhibition.

At the occasion of this special exhibition a catalogue of exhibits was published and caption/labels for each object were also prepared for the better understanding of the visitors. It was at that time that we usually had problem to describe the dates of Indus civilization. The dating of Indus civilization is not clear. Therefore, I would like to consider the date of Indus Civilization through this paper.

In 1982, Prof. Allchin described the dates of Indus Civilization between c.2500 B.C. to 1800 B.C. [Allchin, B. & R: 1982]. While several recent researches give little older date than the date given by Allchin. For instance, American Mission working at Harappa has provided dates, based on C-14 tests, for different phases of Harappa Culture as below:

HARAPPA

Phase 1:	Ravi (Hakra) Phase.	Cr. 3300 --- 2800 B.C.
Phase 2:	Kot Diji (early Harappan) phase	Cr. 2800 --- 2600 B.C.
Phase 3:	Harappan (Indus civilization)	Cr. 2600 --- 1900 B.C.
	Sub phase 3A	Cr 2600 --- 2450 B.C.
	Sub phase 3B.	Cr 2450 --- 2200 B.C.
	Sub phase 3C .	Cr. 2200 --- 1900 B.C.
Phase 4:	Co existence phase (HRP & Cemetery H)	Cr 1900 --- 1800 B.C?
Phase 5:	Cemetery H culture,	Cr 1800 --- 1300 B.C?

Yet we have another set of dates from Dholavila, provided by the Archaeological Survey of India:

DHOLAVILA

Stage I:	Pre-Early Harappan	Cr.3300--2800 B.C.
Stage II:	Pre-Early Harappan	Cr.2800-- 2700 B.C.
Stage III:	A&B Mature Harappan	Cr.2700-- 2400 B.C.
Stage IV:	Mature Harappan	Cr.2400-- 2000 B.C.
Stage V:	Late Harappan (Settlement temporary abandon)	Cr.2000-- 1800 B.C.
Stage VI: Abandon	Late Harappan (abandon)	Cr 1700 B.C
Stage VII	Post Harappa	Cr 1600---1500 B.C

(Based on Joshi & Bishit: 1994)

(These dating are fundamentally based on analysis of C14 dating).

On the other hand, we have other dates based on two methods (i) On the study of Mesopotamian inscriptions and documents and (ii) on the cross-dating method.

INSCRIPTIONS

In some of the Mesopotamian inscriptions and documents the word "Meluhha" appeared. This word "Meluhha" was used for referring to "Indus Civilization". It mainly occurs on the documents belonging to the period from 2350 B.C. to 1800 B.C. Therefore, based on the study of these documents /inscriptions, the date of Indus Civilization seems very probable as Cr. 2400 or 2350 B.C. to 1800 B.C.

CROSS-DATING.

In 1930s, C.J. Gadd studied Indus style seals from Mesopotamia. According to his analysis, the date of these seals concentrated from 2500 B.C. to 1500 B.C. In 1986, T.C. Mitchel analyzed the Indus seals and Persian Gulf seals from Ur. According to Mitchel, the Persian Gulf type seals from Ur mainly belonged to Larsa period of 2000 B.C. to 1800 B.C. Therefore, in my opinion, the similar type of seals from Lothal, may be assigned the same date.

The archaeological material that indicates the relationship between Indus civilization and Mesopotamia and Persian Gulf are some kind of Chlorite vessels carved with 'basket mark' on the surface. Such vessels were found at Moenjodaro, Tepe Yahya, Shahdad, Susa, Kish and Umm an Nar. Vessels with different type of surface decoration such as "triple circle" between two parallel lines are reported from Tepe Yahya, Susa, Ur, Larsa, Bahrain (i.e. Ein Umm Es Sujur in Bahrain), and Umm an Nar. Their date is between 2300 B.C. and 2000 B.C.

The carnelian beads are the characteristic objects of the Indus Civilization and were exported to Mesopotamia. There the Indus type carnelian beads were found in Royal tomb of Ur, dated between 2100 B.C. and 2000 B.C.

In addition to above, I would like to mention about 'stone statues of Lamb. A couple of statues of lamb are reported from Ein Umm -es-Sujur in Bahrain and a similar one from Moenjodaro. Former were found by G-Bibby at Ein Umm- es-Sujur in 1954. In 1990s, we re-excavated the site in question and found two wells. One was discovered earlier by Bibby (We called 'well - 1), and the other one was discovered by Japanese Mission (we called 'Well - 2'). Well-1 is older than Well-2, but both belong to the period of "City II" which is dated cr. 2300 B.C. to 1700 B.C. As such, we presume that these figurines of lambs found in the wells belong to the same period between cr. 2300 B.C -1900 B.C. Based on this evidence, I think that the statue of Lamb from Moenjodaro is nearly of the same age.

From the above, it is possible to say that the dates of Indus Valley Civilization, based on the study of inscriptions and other material remains, ranges between 2400 B.C. to 2000 B.C. or 1900 B.C. Therefore, the dates for the beginning of the Indus Civilization can not be stretched to 2500 B.C. But , the new researches mostly based on C-14 advocate higher dates of 2800 or 2600 B.C. to 1800 B.C. If we accept the date introduced by recent researches, (2800 or 2600 B.C. to 1800 B.C), it is pertinent and necessary to consider that there are at least two stages in the first half of the chronology of Indus Civilization:

- Formative stage (formation of first city and some interracial activity).
- Expansionary stage (Full urbanization and flourishing long distant trade)

When, where and how did the first stage start? We are unable to comment on this question but we may hope that with better understanding and knowledge of related aspects of Indus Valley Civilization shall be possible through fresh researches and discussions on the subject in future.

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LANGUAGE OF INDUS CIVILIZATION

Dr. Hidayatullah Akhund

The disciplines of Mathematics, Astronomy, Astrology etc were very common in the Indus Civilization. They had invented a writing system of their own. What was their language? Arguments that the Harappans spoke an unknown language appear to be denied by the evidence for the importance of their culture. There is no evidence that the end of Harappan civilization was caused by a genocide and extinction of the race (Fairservis, 1992).

Mahadevan trying to decipher the Indus Script has argued three recent developments:

- “Indus Valley” has now turned out to be the largest Bronze Age Civilization known to ancient world.
- “Recent advances in Dravidian studies have led to an increasing realization of decisive influence of Dravidian substratum on the evolution of Indo-Aryan languages and Hindu social institutes. It is now well established that the Dravidians were present in northwest India when the Aryans entered the country, most probably some time around the middle of second millennium BC.
- Systematic studies of Indus script using scientific methods of statistical – positional analysis have led investigators to the conclusion that the Harappa language is typologically non Indo European and resembles the Dravidian languages closely. In particular, it appears that the Harappan language was monosyllabic and of suffixing type with Dravidian like word order.

Taking the totality of available evidence the hypothesis of a Dravidian authorship of Harappan civilization seems to offer the most promising line of investigation. Absolute certainty can however be reached only when an acceptable solution to the riddle of the Indus Script emerges in the fullness of the time.

Mahadevan has carried out his studies on the bilingual situation – Indo Aryan and Dravidian. He says: One has therefore to be on the look out for lyres of the parallelism as well as different and after divergent, streams of parallelism. As a result the Harappan sign, word and its meaning many be reflected in Indo-Aryan and later tradition

The two great linguistic traditions of India, Indo-Aryan and Dravidian continually acting and reacting upon each other and yet another dimension to this picture. We saw that the



Indo-Aryan were influenced by substratum Dravidian languages and moved closer to letter in many way. (Mahdevan, 1979:260-264).

In view of Asko Parpola the grammatical analysis provides some typological features which point out to an agglutinative language and more specifically to the only agglutinative language family known to have existed in India before 1000 B.C. namely the Dravidian. Such features are the apparent presence of only suffixes as a means of inflection, the use of same grammatical endings for most words, the alternation of the plain root with the root and suffix to express the possessive case before another noun, and the word order in which the qualifier precedes the qualified word.

There are two well known facts that have long been considered by eminent scholars to favour an identifications of the Harappan language as the Dravidian. One is the presence of Dravidian language of Brahui in the immediate vicinity of Indus valley, as relic surviving in the mountain lands Baluchistan and Afghanistan which are of difficult access. The other is the considerable sub stratum influence exerted by Dravidian upon the language of the earliest Indo Aryan literary document, the Rigveda composed in the upper Indus valley at the end of second millennium B.C.

Additional proof for the Dravidian identity of the Harappan language are some toponyms specially the Sumerian name of Indus valley and Baluchistan Mel-luh-ha to be read in the early documents with the alternative value as Me-lah-ha which corresponds to Pali mullakkha and Sanskrit mlecha "Barbarian".(Parpola, 1981:120)

The words aeka, dasa, sata, and happt used for one ten hundred and seven respectively in these inscription, indicate that the language was Indo-European. This is the view of S.R.Rao. He further says the word pa 'protect' ap water ama strength pat master, govern sas rule sap curse sada eminent. Suggest an Indo-European language namely the old Indo Aryan. Grammatical features, such as inflexional endings used in inscriptions for instrumental, dative and genitives cases, also correspond to those used in old Indo-Aryan.

The very fact that the Indus language is in-flexional precludes the possibility of its being Sumerian which is an agglutinative language. The presence of conjunct consonants (Samyukta akshers) and use of distinct sign for voiced and voiceless stops, namely K and G, T and D, P and B are contradictions for the Indus language belonging to the Dravidian group

The sealing found in the warehouse at Lothal bearing impression of packing material on the reverse and of the seal on obverse, confirm that the seals were used mostly for authenticating goods in commercial transaction or certifying payment of tax it any. But

there are several seals and copper tablets from Indus cities, which suggest their use as tokens on religious occasions or as prayer tablets.

The Harappans spoke an archaic form of the old Indo – Aryan language and observed religious rites similar to those of Vedic Aryans and bore names, which are preserved, in Rigveda.

An important contribution of the Harappans made to the progress of civilization is the simplification of a complicated writing into an alphabetic system. The Semites who had trade relations with them appear to have borrowed the Indus signs for their consonantal value and later the Greeks added a few signs for the vowels and perfected the Alphabet. The pioneering effect, however was made by Harappans. (Rao, 1984,193-198)

Swami Shankaranda and B.M. Barua even felt that this language had tantric overtones.

The renowned historian father Heras had said that the people of Mohen-jodaro and Harappa were Dravidian who spoke a proto-Tamil language and their script was picto-phonographic.

S.M. Punekar in his book 'Mohen-jodaro' seals has expressed his view that it is not Sanskrit, but rather some Indo-Aryan dialect is amply proved by the readings. As these seals deal with the Vedic age as Vedas themselves employ a language known to scholars as Vedic Sanskrit. We can conjecture that the Vedas (or parts of them) were translated into the received dialect or a created artificial language we call Vedic, if so, that work was done by Vyasa and his associates to avoid the confusion of dialects.

It is a futile task to reconstruct the language of the seals. Out of the lot 101 seals hardly two seem to use complete sentences. The rest of them are names and patronyms. Possibly after all the four thousand available seals are read, we might get a hundred sentences on which we could reconstruct a rudimentary grammar of the Harappan language. I suspect that will never be possible.(Punekar)

Fairservis has discussed the four language possibilities:

- Munda. An Austro-Asiatic family, largely spoken by tribal people in the eastern portion of subcontinent. Reconstruction of Proto Munda indicates nothing as complex as the Harappa [an] Civilization. For example there is an absence of words for wheat barley and cotton – Staples of the Harappan country.

- Indo-Aryan the language spoken by the Vedic people who inhabited the subcontinent after perhaps 1500 BC. Their origin as expressed in Rig-Veda were Central Asian with heavy emphasis on cattle and horse pastoralism. From Indo-Aryan has descended various languages, such as Punjabi, Sindhi, Gujrati, Hindi and others spoken in traditional Harappan territories today. Language specialists in general acknowledge that already indigenous tongues like Dravidian probably influenced the development of Indo-Aryan languages on the subcontinent.
- Other languages: There are variety of languages, such as those of Turkic branch of Altaic, which entered India in times of Turk-Mongol conquests, but these are remote in time and space from Harappan. The Sumerian language which was contemporary with Harappan had agglutinative characteristics, which would relate eventually to an Altaic ursprache, but this is by no means confirmed. There is in any case no evidence of a Sumero-Harappan language affinity based on contacts revealed so far by archaeology. While there is always the possibility that some of the languages still spoken today in remoter parts of subcontinent and adjacent regions were of original Harappan stock, neither by local history or cultural relic are those viable conditions for the language we seek.
- Dravidian. This language family is today largely found in south India, where it is spoken by nearly one hundred million people. After detailed discussion Fairervis finally arrived at the conclusion: It is believed whole is the proof that the Harappan language was basically an early Dravidian language and the script was a Logo syllabic system using that language within the formal boundaries created by utilitarian needs of Harappan Civilization.(Fairervis, 1992:14-23)

Until now the origin of Indus Valley language and script are being searched in Dravidian, Sanskrit and even Semitic, languages. It has been revealed that Sindhi language contains a number of words, which do not belong to either of the languages mentioned. According to the experts these words existed prior to the emergence of Vedic Sanskrit and have survived to this day, only script kept on changing.(Talpur, 1995)

Dr. G.A. Allana suggests that archaeologists should think over and try to study the Sindhi and Siraiki languages and identify the signs inscribed on the seals unearthed from Indus Valley and search for equivalent lexemes from Sindhi and Siraiki languages as most values selected from Dravidian languages are similar to the equivalents of Sindhi and Siraiki.

The following arguments will throw light on my point of view:

- Migration of people from Iran towards Sindh started around 4000 BC and in next 200-300 years they reached Baluchistan, and many sites in Kohistan, namely Arbjo Shahjo, Karchat, Tando Rahim, Ali Murad, Wahi pandhi, Chakarkot, and Naig as explored by Mujaṁdar. From there they moved to Amri around 3500 BC, where they evolved the technique of growing wheat.
- Neolithic and chalcolithic people were of same type of Indo-European people, looking like Sikhs, Jatts and Juts and spoke same proto Indo-European language. From which evolved the proto Sindhi proto Punjabi proto Gujrati and also proto Hindi.
- Around 1000 BC came Rig Vedic Aryans. Vedic Sanskrit was a language spoken in some parts of north western parts of sub-continent, or it was spoken in Hindukush mountains, or even the eastern Caspian sea area. Most probably it was a language like proto Sindhi and proto Punjabi and proto Hindi. (Panahwar, 1981:18)
- Dr. Rafique Mughal proved that from Amri to Jhangar it was the same people and continuation of the same culture. He called Amri and Kot Diji early Indus culture, Harappan the mature Indus culture, and cemetery-H, Jhukar and Jhangar became the declining Indus culture. Indian scholar Sarkar published his works "The races of Sindh Punjab and Baluchistan" in 1964. This was based on results of examination of skulls from Mohenjodaro and Harappa which were sent to England in early thirties and reports were received back after 30 years. The report beyond any doubt proves that these people were not Dravidian.
- Rig Vedic Aryans appeared on Sub-continental stage after 1050 BC. This is based on Radio Carbon Dating.
- The original home of proto Indo European (not Indo Aryan) is still not fully documented by archaeological exploration and evidence. Common vocabulary of Indo-European languages suggest that before dispersal they were nomadic or semi nomadic pastoral people. They had cattle, sheep, dog, goat, goose, horse, wheel, axe, and yoke.
- Anthropologists think that proto Indo-Europeans were living together in limited area and though most probably were not of same race but essentially they had a common culture. There is archaeological evidence of migration of some tribes to Indus valley from Iran around 3500 BC or earlier. It has been shown that these people later on were to develop Indus valley Civilization and their various phases or denoted by Amri, Kot-Diji, Harappa, Cemetery-H, Jhukar and Jhangar culture. They looked like present Sikhs, Jatts, Jutts and some other indigenous tribes of Sindh, Baluchistan and Punjab.

- It is fair to conclude that they were not dravidian and they most probably brought with themselves a group of languages resembling one another and when in close association over a long period in Indus valley civilization area, developed their resembling languages further by continuing exchange of many loan words from one and other, retaining their respective core idiom and structure. By the end of the decline of Indus culture (1000 BC) those proto languages, Sindhi, Punjabi, Gujrati and Kashmiri were already in shape.
- In the opinion of Dr. N.A. Baluch, the language represented in the Mohen-jodaro seals is of pre Aryan, pre Vedic times. He has given a number of Sindhi words which seem to be very old and possibly were in common use during the rise and fall of Indus civilization.(Baluch,1992).

Those scholars who have worked on the Indus script took for granted the assumption that Moenjodaro people were Dravidian and spoke a Dravidian language. They went to the extent of feeding data to computer to resolve what human brain can not. The results have been total failure. When the Egyptian script was deciphered first, the Egyptologists turned to rural area and their day to day language, they were able to translate lines, paragraphs and whole stories. Unfortunately we have been on wrong track in our assumption that Dravidian was the language of people of Indus Civilization.

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PROTO HISTORIC SEQUENCE OF SWAT AND ITS CO-RELATION WITH THE INDUS VALLEY CIVILIZATION

Badshah Sardar, Amanullah

The research studies carried out in the last 43 years in the Swat Valley by the Italian Archaeological Mission with the collaboration of the Department of Archaeology and Museums, Government of Pakistan and the Department of Archaeology, University of Peshawar, has allowed the construction of a stable foundation of proto-historic chronological sequence of the Swat Valley. This sequence is still unique in Pakistan. The survey and exploration work of the proto-historic sites of the Swat Valley was started by the Italian Mission back in 1958 and reported such sites throughout the sub-valleys of river Swat and its tributaries (IsMEO, 1982:2). However, in the present paper only two sites shall be discussed as they provide us with complete sequence from earlier phases of proto-historic period to historic era.

The earliest evidence on the proto-historic Swat has been recovered from the Ghalegai Rock Shelter and Birkot Ghundai, documenting as early as neo-lithic period of the Swat Valley. The excavations at this rock shelter have provided an evidence of occupation from the beginning of the 3rd millennium B.C. to the historic period (ISMEO, 1982:10).

GHALEGAI ROCK SHELTER

The Ghalegai rock shelter lies between the village of Ghalegai and Barikot; to the left of the main road from Mingora to Mardan within the rocky slopes that dominate the Ghalegai village and its surroundings. The shelter had provided a favourable environment and was even used as a stable dwelling continuously as the material, discovered during the course of excavations, strongly suggests. The Mission carried out excavations on the site in 1967, 1968 and 1980. These excavations helped in determining the chronological sequence of the proto-historic culture of Swat. These excavations also yielded the first finds, which are closely related to the cultural affinity with the artifacts of the Indus Valley Civilization (Stacul, 1979). The seven successive periods provides a complete time-scale dated from early 3rd millennium B.C. to 4th Century B.C. (IsMEO, 1982:2)

The excavations here revealed the strata, rich in pottery and in stone implements, belonging to different successive cultural levels. The long period of use of the site can be judged by its various successive phases. These well-differentiated consecutive phases, produce sterile deposits, are evident by rich ceramic remains, which throw light on the different cultural aspects of the shelter dwellings. It is very significant to note that most of the discovered materials are related to those already noticed in other parts of the Swat Valley or the surrounding regions but not in a sequences as the present sites. The

materials evidences from Ghalegai rock shelter goes back as far as 3000 B.C and provide an evidence that of stable settlements were actually in existence from the earlier times (IsMEO, 1982:10 & Stacul,1979:307).

Period-I (3000 B.C.) : The earliest occupation of Period-I, which partly lay on the bedrock, has produced stone artifacts made of pebbles: (uni-facial and bifacial choppers, wedge-shaped flakes, discoidal scrapers) together with rather coarse hand-made pottery. On the basis of C14 determinations, it has been dated to the beginning of 3rd millennium (IsMEO, 1982:10). Apart from a multitude of pebbly tools industry the strata have disclosed a certain quantity of hand made pottery of rudimental clay including jars cups bi-conical bowls and bowls on stand. The pottery resembles, limited to a few shapes; the vases common in the sites of Namazga Tepe, in Turkmenistan dated c.3000-2500 B.C. (Khan,1968:140).

Period-II (2400-1900 B.C.) : A deep cultural change falls around the middle of the third millennium B.C. Period-II shows a definite change in the artifacts consisting in the prevalence of a very fine wheel-turned pottery, usually painted with black-on-red. This pottery is very compact and hard-tempered, while no evidence of pebble tool industry has been recorded. The vegetable remains found near the hearths include charred seeds of wheat and rice as described by Stacul (1985).

The earlier evidence of black-on-red wheel-turned ware in the Swat Valley, occurred at Ghalegai in layers dated to the second half of the 3rd millennium B.C. The excellent quality of the pottery of Period-II suggested its relation with the Indus Valley Civilization. Most of the pottery decoration and its shapes suggest the early Harappan style.

The shapes of the pottery recall the specimens of the Harappan pottery both in the phases prior to the construction of the defensive walls, and the more improved types found in cemetery R. 37(Stacul, 1985).

Period-III (1900-1800 B.C.) : A further deep cultural change occurred at the very beginning of the second millennium B.C. when the fine wheel thrown pottery almost completely disappeared. The main feature of the new complex Period-III is a coarse hand made ware and reappearance of pebble tool (uni-facial and bifacial choppers, wedge shaped flakes discoidal and turtleback shaped scrapers).

The pottery is hand made and very crud forms, heavy in section and ill fired, almost all the pots bear mat or basket impressions on the base, parallel with the wares and shapes from the late Neolithic culture of Burzahom in Kashmir (Tapar,1985:25-28).

The vases are hand made and are all-rudimental and offer a limited group of shapes. It is, however, interesting that such types of pottery have also been found in the early phase of Burzahom in Kashmir, and at Mundigak in Afghanistan(Khan, 1968:140).

Period-IV (1800-1500 B.C.) : The subsequent Period-IV, identified for the first time at Ghalegai, was evidenced in recent years at various sites of Swat, such as Loe-Banr-III, Kalako Dheri, Birkot Ghuandai, Aligrama, and Damkot. On the ground of radiocarbon determinations Period-IV has been dated between 18th and 15th centuries B.C. (Stacul, 1985:357)

Some innovations arise from the beginning of this period are new settlements in hilly sites; the development of farming; the emergence of metallurgy and the spread of the black grey burnished pottery. Other changes occurred gradually and reached at their peak around the mid-second millennium B.C. The frequency of the painted, wheel-turned wares, decorated with animal figures and plants for the first time, increased in this phase. The pottery is marked by new wares and shapes. Black, grey and buff burnished wares are well represented and they occur with brown gritty as well as black on red painted ware.

If we look at the subsequent protohistoric times, it becomes apparent that the culture of Period-IV was a short-lived chapter in the proto-history of the Swat Valley. During the 14th Century B.C. or later, a new culture spread over the northern, hilly regions. The large cemeteries as Loe-Banr-III, Aligrama, Katelai and Butkara-II lasting from 14th to 4th century B.C. provide an evidence of the co-existence of different burial rites, as inhumation and cremation. Graves's typologies and burial rites and funerary furnishings of these sites, however, are quite homogenous and reveal changes on the basis of which this long lapse of time may be divided in to three periods.

The cultural history of the sites, which resulted form the diverse typology of the materials, found during excavations, can be correlated with the cultural materials of the Indus Valley Civilization as below;

- The wheel turned black-on-red painted pottery in the Swat Valley; occurred at Ghalegai rock shelter dated to the second half of the 3rd millennium B.C.
- Similarly the excellent quality pottery of Period-II suggested its relations with the Indus Valley Civilization.
- Most of pottery shapes and decorations have similarity with the early Harappan or Kot Dijian style also.
- The pottery of the period-III is hand made of very crude forms, heavy in section and ill fired featured by mat or basket impressions on the base.

parallels with wares and shapes from the late Neolithic culture at Sarai Khola I and Burzahom in Kashmir.

- The similar hand made vases have also been found in the early phase of Burzahom in Kashmir, and at Mundigak in Afghanistan.
- The painted pottery of the period-IV stresses several influences first attributed to the Harappan and late Harappan culture.
- The pottery bearing decorative motifs revealed clear affinity with the ceramics of Harappan and late Harappan culture.

BIR KOT GHUNDAI

Further evidence of proto-historic culture of the Swat Valley came to light as a result of recent excavations at Birkot Ghundai-a hill which rises near the modern village of Barkot (Bir-kot) on the left bank of the Swat river, about 20 Km from Mingora. The recent work at Birkot Ghundai brought into evidence superimposed building phases of different proto historical periods at the lower level of the mound. The earliest occupation phase consisting of walls made of river pebbles, square rooms and clay floor levels may be ascribed to the 4th period in the Ghalegai sequence.

POTTERY TYPE: The most striking feature of this cultural complex is represented by the black grey burnished ware, which comprises about half of the pottery collected. Remarkable shape of this ware is the bowl-on-stand. The brown gritty ware, in shapes such as the jar with rippled rim and basket impressions on the base, is also largely represented.

As regard the red pottery in particular, it is made up of good quality clay, well-baked and medium to fine in texture, with red orange-red and brown-red slip. Common shapes are large open-mouthed storage jars, almost globular pots, bowls-on-stand, dishes and basins.

POTTERY DECORATIONS: Pottery decoration consists of black paintings, cord-marked impressions and burnishing. The range of painted designs is various. Commonest and simplest decorations consist of horizontal lines. Other linear or schematic motifs include comb-patterns, wavy lines, chequers and stars.

As regards links and affinities, some shapes on red ware consent general comparisons with Harappan pottery types, such as the bowl pedestal, the large conical pedestal stand; the basins with flared and concave sides. The same shape of basin may be compared also with types from Cemetery H. (Stacul, 1979:9)

FLORAL DESIGNS: Among the floral design, very common subject is the papal tree. Some floral representations such as the pipal leaves and the four petalled rosettes clearly recall

the Harappan painting tradition of the Indus Valley Civilization. Other designs may be compared rather with patterns ascribed to the culture of Cemetery H. (Stacul, 1979)

FAUNAL REPRESENTATIONS: The faunal representations mostly consist of birds. In additions to the peacock, there also occur a duck, pair of bird's heads like multi-rayed sun-motifs, and a sequence of birds between astral symbols. The careful finishing of some details suggests a keen observation of nature and represents the morphological group of the Harappan ceramics. (Sradar, 1992)

By the analysis and comparison of proto-historic archaeological finds at Bir-kot Ghundai, it is possible to correlate them with the cultural artifacts of the Indus Valley Civilization as follow;

- Ceramics, tools industries, remains of skeletons and burial rites indicate a very changeful history.
- Hand formed ceramics are evidence for the first phase of the site, according to radiocarbon dates this can be dated between 2400 and 2100 B.C which shows strong affinities with archaeological finds from Tepe Hisar and Turkmenistan.
- A second period has similarities with Neolithic finds in Baluchistan and with the Harappa culture of the Indus Valley civilization. In this period the potter's wheel is in use. It begins around 1800 B.C., which is about the same time as the beginning of the decline of the Indus Valley Civilization.
- It may be noted that the multi-rayed heads represented in pair, as well as birds and astral symbols depicted in panels occur on burial jars of Cemetery H at Harappa.
- Two faience star-shaped beads may provide more evidence on the relation with late Harappan cultures with dotted concentric circles at the center; a type that recalls a painted motif common on pottery of Cemetery H.
- The painted pottery of Bir-kot Ghundai shows various influences reported first to Harappan and late Harappan cultures.
- The spreading of this art of pottery painting in the Swat Valley, which lasted for a period of two or three centuries after the end of the Indus Civilization, is an event of great interest and it seems to take its inspiration from different style traditions.

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**ARTS
&
CRAFTS**

AESTHETIC APPRECIATION OF ART AND CRAFT OF THE INDUS PEOPLE

Dr. Muhammad Iqbal Bhutta

A deeper appreciation of the colloquium logo reveals that Indus valley society had a good natural aesthetic sense. It is not only an expression of artist's perception of natural life around him but equally the high standard of the society of that time that appreciated such an artistic approach. Two aspects of this logo specially deserve to be mentioned namely the life, lifelike three-dimensional representation of Brahmani bull and the neatly and well-proportioned letters calligraphed on the top of the animal. The humps, dewlap and genitals have been realistically drawn and engraved in steatite stone despite its miniature scale. The volume of the body is nicely reflected with light and shades cast in three dimensions. Only contrary to the side pose of the bull, the long crescent shaped horns are shown in three quarter so that is not mistaken to be a unicorn/unihorn animal as seen in so many Indus seals. The lettering of the seals, whatever these stand for, reflect a long drawn tradition of a developed script and the sense of beauty and harmony of the members of the society for whom the seals was prepared. Thus this one single object, picked up out of thousands of similar seals discovered during excavations epitomizes the sense of beauty, harmony and proportion of Indus society. (Mustafa & Parpola, 1991: 417) The engraver of this seal must have been greatly appreciated by his society some 5000 years as 'we' are appreciating it by selecting it as a logo for this colloquium.

In Palaeolithic art, man in a supreme feat of intellect, learned to abstract his world by making a picture of it. Thus he sought to control it by capturing and holding its image. In the Neolithic period he made the giant stride towards the actual, concrete control of his environment by inventing agriculture and domesticating animals. His food supply assured, he changed from hunter to herdsman, to farmer, and perhaps as early as 7000 BC to townsman. (Horst et al, 1975: 36-37)

Art in Pakistan and India, since its beginning, has been dedicated to the religious systems of India-Brahmanism, Buddhism, Jainism and the many indigenous nature cults that have always flourished in Asia. It has been an art concerned with the statement of the traditional principles embodied in these faiths and never with the self conscious creation of beauty for its own sake. The monuments of the great periods of Indian art history are icons with primary utilitarian function of presenting the divine prototype in material form for the express veneration of the worshipper. If they are beautiful or moving, it is because they have been effectively fashioned to fulfill this purpose and not because the craftsman deliberately set out to make something "artistic" with superficially pleasing surfaces. It was the final purpose of art in Pakistan and India to present to the believer all the truths and certainties of his religion.



If we talk about the art of Subcontinent, we divert our attention to the Indus Valley Civilization, which has ever depicted the rich cultural activities of the time. When we talk about the culture, our attention naturally is diverted again towards early and mature Indus Valley Culture (c.3300-c. 2000 B.C.). The architectural remains of Mohenjodaro suggest a modern commercial center with major avenues along a north-south orientation, streets as wide as 30 feet; multi-storey houses of fired brick and wood and the elaborate drainage systems. It has been determined that commercial and artistic links between the civilizations of the Indus and the country of Euphrates are confirmed. It is for this reason that the name "Indo Sumerian" has sometimes been used to describe the culture of Mohenjodaro". (Runes et al, 1946: 456)

STATUS

The designation of the Indus Valley Culture is, however, to be considered more appropriate for a period so predominantly Indian in character. The few fragments of sculpture found at Mohenjodaro include a number of male heads and busts faintly suggestive of Mesopotamian forms in their connections and heavy, static form which may perhaps be identified as priests of a Shamanistic cult. On the other hand, we can say some sculptures from Indus civilization reflect Mesopotamian influences (Horst et al, 1975:802) while others indicate the presence of a thoroughly developed Indian tradition. A small mail torso of red sandstone, discovered at Harappa (Sahiwal Distt.) completely represents Indian sculpture and in certain respects, already prophesied the expression and technique typical of the historical periods of Indian art. (Runes et al, 1946:456)

The latter is exemplified by this miniature torso, in first glance, appear to be carved according to the precepts of Greek naturalism (some question the dating of this piece). The emphasis given (by polishing) to the surface of the stone and to the swelling curves of the abdomen, however, reveals an interest, not in the logical anatomical structure of Greek sculpture, but in the fluid movement of a living body. This sense of pulsating vigor and the emphasis on sensuous surface remain chief characteristics of Indian sculpture for thousand years. It is distinguished by that miraculous realization of the very quality of flesh in stone that has always been one of the special achievements of the Indian craftsman. The surface of the skin is taut, as though undergoing the tension of an expanding inner force. It is this quality that is responsible for suggesting the roundness and fullness of the form. This is the technique of elimination in which all details of superficial initiation are avoided and only the essential articulation and form of the body are given. (Horst et al, 1975:802)

ICONOGRAPHIC MOTIFS ON INDUS SEALS

By far the most numerous class of objects found at Moenjodaro and Harappa are the small steatite seals or talisman with remarkably lively carvings of such typically Indian animals as the Zebu, the Urus ox, and the elephant in addition to representations of divinities both Indian and Mesopotamian. The animal are represented from conceptual point of view in the sense that each element of the anatomy is shown from its most characteristic aspect; and the creatures appear marvelously imbued with life. (Runes et al, 1946:456)

Through detailed analysis of the iconography of the Indus seals and tablet we can classify the material into coherent classes unicorn/urus/bison/zebu/buffalo /markhor /goat /deer /rhinoceros /elephant /tiger /hare /snake /gharial /animal group / joined animals /composite animal /tree/ cult object (variously interpreted as a manager, incense burner or filter) ship /swastika and other geometric design. The unicorn motif is the most common on the Indus seals. (Mustafa & Parpola, 1991: xxxii) The style of representing this animal in profile, so that just one single horn is shown, has in all probability been borrowed from the art of ancient Near East. Although this representation undoubtedly has had a mythological explanation and importance in the Harappan religion, the unicorn is likely to be a real animal (probably the urus, or *Bos primigenital*) which actually had two horns. It is infact, sometime depicted as having two horns. (Mustafa & Parpola, 1991: xxx)

"Animal Group" consists of two or more natural animals appearing on one object, either separately or forming one scene like the two confronting bisons. "Joined animals" usually have more than one head or while composed of two or more animals, may not be complete animals. The composite animal, again, is a complete beast whose body parts belong to different animals.

Usually, only one type of composite animal is represented on the seals. It has the horns of the Zebu, the face of man, and the tusk and the trunk of the elephant, the neck and front legs of the goat, the middle body of the unicorn the hind legs of tiger, and the snake for a tail. But in the incised copper tablets from Moenjodaro, one can distinguish several composite animals. The composite nature of most of the animals depicted on these copper tablets has rarely been recognized so far. (Yule, 1985: 32-34) The "mastiff" of the excavation reports appears to be a composite animal put together of the Zebu (horns), tiger (head and front part of the body) and rhinoceros (back part of the body). In this fashion, we distinguish several different composite animals on the copper tablets.

The "anthropomorphic" is another broad category which lumps together almost all the scenes in which any man like figure is seen. . (Mustafa & Parpola, 1991: xxx)

MATERIAL AND PRODUCTION

The great majority of the Indus seals are of steatite, generally whitish in colour. The seals were first sawn and cut into their forms and then polished. The subject was outlined with a sharp point and then engraved with a drill. Finally, the seal was coated with an alkali. Coating was applied mainly to dark steatite in order to make it white. Heating hardens the steatite, which is a very soft stone, and thus protects it against wear. The various stages of this process can be seen from different examples, the unfinished one being particularly instructive. (Mackay, 1935& 1938)

The moulded tablets are normally made of terracotta or faience, while the incised tablets usually are of steatite or copper.

SCRIPT

As far as the artistic beauty of the Indus script is concerned, all of us are well aware that the scriptural evidence in this region is very old than that of Europe. As far as the Indus scripts is concerned, more than 537 symbols tell the story of pictograph writing having artistic touches in their shapes. We can categorize in 8 nos. including 99 symbols, the stylized objects, which are 19 in all, have 132 symbols, and the remainder 306 are grouped under other categories. Although this script is not yet deciphered but the artistic and aesthetic value is not less than any other script related to pictograph group. (Dani, 1986:9)

The slanting horizontal, vertical, upward and downward strokes and iconography, symbols, shows their full command in writing. We cannot feel a lot of difference in the writing of common man and the skilled person as it can be vetted even today.

If we leave aside the additional strokes and compounds, the actual number of signs in the Indus script according to the reckoning is 27 objects and 27 geometrical forms, besides numeral brackets, and two magic emblems. The number is increased to 474 (the remainder 63) being numerals, by following two principles: -

- by combination with other signs
- by the addition of strokes.
- Internal;
- External, from 1-6 besides the arch-like sign.

The combinations are always with some recognizable, objects and strokes are found added to all but the Homo-snake wheel, vehicle and bow and arrow signs. Dr. Dani even challenged.

Can we draw any conclusion regarding significance? Suggestions can be made, and have already been made, but nothing definite can be asserted in the present state of materials. One thing is certain, that the Indus script in it, ultimate analysis, is not very complicated. Probably the two fundamental principles of combination and stroke-additions. If they survived influenced the formation of the conjuncts and the open syllables in the later historical Indian scripts.

MISCELLANEOUS ART OBJECTS

Indus Valley presents unique artifacts and a level of architectural planning that was unparalleled in the ancient world. Elaborate painted pottery decorated with peacocks and geometric design was very different from that associated with historical periods. Hard fired stoneware, bangles, glazed ornaments and bronze tools revealed the technical skills of the Indus artisans in transforming common material into objects of beauty or utility. Even today, many aspects of Indus technology are not fully understood as scholars attempt to replicate stoneware ceramics from ordinary terracotta clay and to produce bronze that was as hard as steel. These development took place in the first cities of South Asia, where traders brought exotic raw material to the city workshops and skilled artisans fashioned ornaments and tools for the common people as well as the elites. This was the beginning of urbanization in the Subcontinent. These early state societies were not totally isolated from one another and there is evidence for trade and other cultural contacts among them, but we can see significant differences in their respective artistic styles, ritual symbols, technologies and social organization. (Kenoyer, 1998:15)

Many of most exquisite objects are extremely small and were often made from raw materials that were transformed through complex techniques of manufacture. Their craftsmanship demonstrates a total control of the medium and the ability to capture the essence of a symbol or figure with a few delicate strokes. The small scale of Indus art objects suggests that craftsmanship and technical qualities were more desirable than gross monumentality .

Fired steatite seals with animal motifs and the undeciphered scripts are perhaps the most commonly known objects, but elaborately decorated terracotta figurines. Carved ivory dice, ornaments of gold and semiprecious stones as well as miniature squirrels and monkeys made in glazed faience clearly reflect the versatility and technical expertise of the ancient artisans.

Given the availability of similar natural resources and raw materials, modern potters and glaze-maker use many of the same production process and firing techniques. The goldsmiths and agate bead makers who make ornaments for modern city dwellers still use many techniques that were first discovered by the ancient Indus jewelers. Bronze-workers

who made utensils and sculptures have preserved many ancient techniques. Bone carvers of today have replaced the ivory workers of the past, but they continue to produce similar ornaments, gaming pieces and inlay. Archaeologists studying the manufacturing techniques and artistic styles of these modern artisans have been able to reconstruct how the ancient artisans produced their striking objects. Through these we can also study some relationship between these crafts and traditional trading practices in order to understand better the economic organization of the ancient Indus cities. By archaeologists are just beginning to bring to light the hidden faces of the ancient Indus people and provide voices for the mute artifacts that they have left behind.

ARCHITECTURE AND TOWN PLANNING

Today over 1500 settlement of Indus Valley Civilization have been discovered which are spread out over 680,000 sq. kilometer of Northwestern South Asian, an area twice the size of ancient Egypt or Mesopotamia for 700 years from around 2600 to 1900 B.C. (Kenoyer, 1998:17)

Between 600 and 300 B.C. when the classical Hindu and Buddhist civilizations of ancient India were established. Many of the technologies architectural styles, artistic symbols and aspects of social organization that characterized these later cities can be traced to the earlier Indus culture. (Kenoyer, 1998:19)

Even today, in modern cities and villages of Pakistan and India we see the legacy of the Indus cities reflected in traditional art and crafts as well as in layout of houses and settlements. These remnants of the past do not represent a stagnation of culture but rather highlight the optimal choices made by the Indus people.

POTTERY

It is only due to pottery drawing that we can easily judge the cultural relationship with Iran and Mesopotamia. Dr.F.A. Khan given the design of steatite vessel from Moenjodaro and Susa and perforated vases from Harappa and Hissar and Antimony rods and pots from Harappa (P. 1-2) and Hissar III, animals head, double animals protomes and bird whistles vessels, etc. (Khan, 1964:46)

Pottery from the upper level i.e. from layers 1 to 3 including half a dozen subsidiary layers is of the typical and mature Harappa culture. It is wheel turned, well fired, thick textured and heavy. Harappan designs of pipal leaf, fish scale, intersecting circles, linked balls, peacock, antelope, sun symbol and other pattern in black paint were executed in the usual bold, free and assured but conventional style, clearly a product of long usage. The pottery forms recovered from these levels include the common Harappan types such as dishes on stand, beakers, goblets, basins, storage jars, cups, saucers, jar covered with lids

are adorned with geometrical pattern and other motifs which were designed artistically.(Khan, 1964:46)

The painted design repertoire in black on red fit well with the known range of decorative design as would be evident from the illustrated example.

This artistic continuity is remarkable, not only because of the time spanned. But because, for the period between the disappearance of the Indus civilization (about 1800 B.C) and the rise of the Maurya empire (3rd cent. B.C.). There are virtually no remains of the visual arts. The Aryan invasions, which began about 1800 B.C. may account for the break in the sequence of Indian art. It is even more amazing, then, in view of the Aryan's profound effect on Indian culture that so many indigenous traits persisted. Destruction by the invaders, as well as the perishability of the material used, undoubtedly account for the disappearance of many of the objects by which Indian traditions were passed on during those two thousand years following the collapse of the Indus civilization. (Horst et al, 1975:803)

CONCLUSION

One can go speaking endlessly about the beauty that rested in the eyes of the scholars as well as the beauty that rested in the objects created by them. There is hardly any aspect of the Indus Valley people that reflect a bad taste or lack of sense of beauty, harmony and proportion. Be it architecture, town planning, statuary. Ornaments art of lapidary or minor art and craft, the sense of proportion and harmony- the hallmark of beauty prevails everywhere. The most important thing worth-noting is that the standard of beauty, harmony and proportion set by the Indus people some 5000 years ago have hardly been suspended. Take the example of town planning, the art of seal making and stone engraving, the art of stone carving like the torso from Harappa and King Priest from Mohenjodaro. The art of smelting as in the case of dancing girl from Mohenjodaro, the perfection reached in the craft of toy making, the refinements novelty and solidity of shapes of pots take, for example, the dish on stand is the excellence of craftsmanship in painting on pottery, the intersecting circles, the fish scales and peacocks and bulls, antelope, etc. You name any aspect of their art and craft, you find the Indus people at the apex, always ahead of their time and always leaving behind a trail to be followed by their successors. The grid iron town planning initiated by them is still being followed. The house plan given by them is still considered the standard and most traditional house in the countryside. Boatmen of Sindh are copying the boats designed by the Indus people. (Kenoyer, 1998:29). The bullock cart developed by them is still found most conventionally around Mohenjodaro and casually at Harappa. The river transport system developed by the Indus people remained in vogue till the invention of the locomotive in late 19th century. The modern ladies of Pakistan still love to adorn themselves in the same fashion, as did the women of Mohenjodaro and Harappa 5000 years ago. In short, the

people of the Indus valley developed their culture with their roots in the soil, which reflects the aesthetics, tastes and potentials of the local people. It was perfect, solid and deep-rooted. This is why it has persisted so long and so far.



Terra Cotta Toy Cart

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TOYS IN THE INDUS CIVILIZATION

Nargis Rashid

In the study of the material remains of primitive or extinct Societies, toys provide some useful hints at the sociological and technological aspects of the by-gone era. As toys are related to the sphere of childhood, they carry through the corridors of time the touching human traits of joy, humor, mimicry, pride of possession, and probably also the dreams to create a better world. In their varying forms from most simple to elaborate, toys can be evaluated in the modern theory of education as instruments of learning, and in archaeology as small landmarks in the evolution of human intellect.

In the Indus Civilization, as in many other civilizations of comparable antiquity, there always remains the pitfall for confusing toys with objects of ritual sanctity. Perhaps, all forms of plastic or sculptural art started from the impulse of worship ingrained in human nature, as can be judged from the traces in Mesolithic caves. Just as the pure science of the modern age has slowly trickled out of the jumble of superstitions, rituals, and magic crafts of the primitive ages, probably so have the pure aesthetic, recreational, and sensuous traits in human nature in the Indus Civilization freed themselves of the earlier rituals. In the artifacts of the Indus Civilization it looks naturally simple to distinguish toys from the few sculptures of ritual significance like the bust of the King Priest, a number of mother goddesses the Indus seals, the ring stones, etc.

It was in the Indus Valley after 2500 B.C., that an urban culture first made its appearance in South Asia. In the 1920s, archaeologists discovered large cities built for more than 40,000 people accustomed to a high standard of living. This sophisticated culture spread with an extraordinary homogeneity of artifacts over an area larger than that of the contemporary Egyptian and Mesopotamian states. (Alexandra, et al, 1997). The Indus Civilization is not only remarkable for its town planning and the building techniques but also in manufacturing the miniature items like toys, which reflect Nature. Pithawalla (1978) perceives in the art of Moenjodaro a cyclical variation of excellence followed by decadence, which is characteristic of progressive cultures. The stretches of monotony or falling curves of qualitative features of the arts and crafts are punctuated with innovative changes and rise of the quantitative curve of productivity. The art of the Indus Civilization is full of vigor virility, symbolism and originality.

Toys as social products involve two personalities, the maker or manufacturer and the player or consumer. Some times on rare occasions, the two are combined in one person, that is a genius or precocious child who devises his own toy out of the raw material, and enjoys display and playing with it with his companions. The quantity of toys recovered from the archaeological excavations of the Indus sites general indicates mass production and uniformity of products, with no clear surviving evidence of the later situation.

According to the latest studies of the economic mechanics in the urban centers of the Indus Civilization (Kenoyer, 1998), there may have been some form of military power to reinforce social and political orders. Artisans of the Indus cities played a significant role by devising new and more complex technologies that required special knowledge and manufacturing processes. They could produce goods of inferior or superior qualities to suit the purchasing powers of the poorer or affluent sections of the social classes. Contrary to the earlier impressions of an egalitarian and socialistic society inhabiting the Indus Civilization, the American excavators at Harappa are exerting efforts to show that in essence it was a capitalistic society, with means of production controlled by the military and civil bureaucracy.

SIGNIFICENCE OF TOYS

Toys are the imitation or reflection of the nature and of cultural components of material life. Learning begins with toys well before the initiation of formal education in all the civilizations, ages and periods. Interaction of parents with Child and the materials provided to the child, represent the curriculum for children's early learning. Toys play an important supportive role in the child's development. The creative use of simple, safe inexpensive and developmentally appropriate materials. Toys, facilitates universal access to this essential and fundamental learning process, which is proved with the existence and presence of abundance of toys from Indus Civilization.

Toys are the tools of play, but the essence of play is the spontaneous and pleasurable activity that promotes self esteem, fine and gross motor ability, language, communication, cognitive ability, social skills, norms and values of their culture. Further more, to teach them how to be the useful part of the social structure. All children benefit from carefully selected toys that stimulate creative interaction and skill development. Toys that encourage physical activity contribute to a child's over all fitness.

Indus valley people were very much close to the nature, where as Miller (1985), is of the opinion that the Indus state saw the development of an idiosyncratic form of social organization, which he thinks to a conservative asceticism. He suggests that the Harappan (Indus) Civilization is basically opposed to nature. In contrast to his opinion, one would find the use of natural motifs, the presence of human and animal figurines in abundance, is enough to contradict such a conclusion.

TOYS TECHNOLOGY & CRAFTMANSHIP

With the rise of cities around 2600 B.C. technology and crafts became essential mechanism for creating unique objects. According to Kenoyer (1998) there may have been some forms of military power to reinforce social and political order; artisans of

Indus cities played significant role by inventing new and more complex technologies that required special knowledge.

Different toys have been found from different levels, sites and indifferent material, such as, copper/bronze, molded faience, stone and terracotta. The people of the Indus were familiar with the techniques of the plastic art. Ceramics became an industry in the period when Indus civilization reached its peak. On a very large scale, with wide variety, ceramics were produced to provide for a broad range of applications. Rafi (2000), perceives that the integration of regional cultures not only created uniformity in styles and patterns in various articles made of ceramics, it also brought about uniformity in the life styles of the people inhabiting a very vast region. This uniformity in life style gave rise to a common pattern of use of ceramics resulting in increased demand of ceramics for specific applications. The production of specific items in large numbers brought about a basic change in the production patterns and techniques.

The abundance of animal figures at the major urban centers suggests that they were commonly used in household and public rituals. Another interesting figurines made from terracotta are quite common at the larger urban centers and smaller settlements as well and according to Kenoyer (1998) the earlier figurines were hand modeled, but towards the end of the Indus period many were mass-produced with molded beads attached to a hand formed body. Among the other figurines of bulls, humped bulls have also been found, are extremely large and elaborately well defined and its hollow molded head is fixed with extra care with the help of carving tools and applique.

MOVABLE TOYS

Along with the hollow individual animal toys, ram figurines on wheel found from Chanhudaro, its head and body are painted with hatched design with light red color. Having two wheels on both sides.

The fascinating Toys are those with movable-heads. One of the bull is found from Chanhudaro has the head which is supported by a string passing through a hole in the neck. Many such figurines have been found from the sites.

Another interesting toy is a toy-cart with roof and side panels. A short ledge in front of cart is a serve as a seat for the driver. According to Kenoyer (1998) this cart was probably made by lost-wax casting. A second cart with driver was found at Chanhodaro and similar carts have been recovered from Harappa. From Nausharo, a toy cart with two wheels is recovered. Holes are present along with the length of the cart; to hold wooden sidebars, and at the center of the cart two wooden sidebars could be extended below the

frame to hold the axle. A long stick inserted into the holes at the end of the cart would have been used to support a yoke.

VARIOUS ANIMALS FIGURINES

Like the most common motif on seals is the unicorn (a mythical animal that Greek and Roman sources trace back to the Indian subcontinent. (Marshall 1938) From Chanhudaro a painted terracotta figurine of a unicorn is found. Unicorn found from Moenjodaro and Harappa is all slightly different. Owing to the native or local artistic practice. The presence of unicorn figurines shows that the people of Indus Valley civilization believed as an only mythical creature and much more the people belonged to this clan or trading community. The other animal figurines are the toys of dog and bear with collars suggest the open shows by the professionals on the streets of the cities with trained bears, monkeys and dogs to earn money, is also proved with the discovery of the terracotta figurines of a begging dog from Harappa; wearing a beaded collar. These animals may have been trained to amuse the children.

Among the domesticated animals bull is the most common animal which shows stylistic changes from the earliest joined-legs to the latter articulated legs. Water-buffalo figurines are found from Harappa with wide spreading horns.. Numerous terracotta figurines of Rhinoceros found from Harappa painted elephant head with stylized wide spread ears from Harappa. Among the wild animals, tiger figurines with incised facial features discovered from Harappa.

From the Moenjodaro and Harappa the most favourite of all for the children there could be the one pets is Bunny Rabbit's figurines; these rabbits are hollow. Besides the above mentioned animal toys the others are Peacocks, Pheasants, Pigeons, duck and the wild jungle fowl, are all represented by terracotta toys plain or painted indicates the people of Indus Valley Civilization, have given a full attention to the grooming of their children though representing almost all animals in terracotta and other materials to keep in constant link with the social awareness and exposure to the life to be the successful part of their society and culture.

STONEWARE AND FAIENCE TOYS

Molded faience amulets of a palm squirrel, three monkeys in embrace, and a seated monkey show that these amulets were specially molded for children according to their desire and choice, to keep their favorite animals near to themselves. Mostly terracotta figurines represent all major wild and domestic animals, but only a few animals were made of stone or faience. Two fragmentary stone sculptures of a seated ram were recovered from excavations at Moenjodaro. (Alexander, et al, 1987) the face of one figure was missing, but eventually was recovered many years later during surface survey. This figure depicts a large male sheep with a massive bearded jowl and curled horns.

Besides stone sculptures of a ram, sheep figurines were also made in terracotta and faience. One of the miniature glazed faience figurines of seated rams has a small perforation near the neck so it could be worn as amulets. Owing to the thick white glazed surface the delicate modeling of the face got hidden. These figurines have been found at both the urban centers of Moenjodaro and Harappa.

MULTIPLE ANIMALS AND HUMAN FIGURINES

Further, serious figurines have been discovered, used as puppets or for special rituals; combine several different forms of animals. Two such examples discovered from Nausharo, hollow three headed figurine, reddish brown in color: tiger's face is clear and head of a water buffalo or bull is still attached. Another gray-colored example shows an elephant with a hollow trunk, as two horns from the mission head of a water buffalo curve along side of the elephant's face. One can see at the bottom jaw of a feline with bared teeth at the back of the elephant's head. From Moenjodaro, an animal-headed, pot-bellied, ithyphallic human figurine or puppet has also been discovered.

The amazing thing is that Nausharo has the only terracotta figurines of multiple animals, where as from most of the larger sites multiple-headed animals are found on seals.

RATTLE AND WHISTLE TOYS

Similar to the other Toys some special Toys were also manufactured to create whistles and sound to attract children of all ages. Such as hollow, hand modeled bird figurines of terracotta used as a whistle. Specially represented by pet birds such as partridges or doves.

Spherical Rattles, painted in red brown designs, on cream surface. These noisy clay rattles may have been used to amuse infants to make them active. Broken examples of rattles show that this type of rattle was made from two pieces of clay with tiny clay pellets fired while inside the sphere, recovered from Chanhodaro. Simple shall balls have also been recovered from Mohenjodaro and other sites. It is unique carved ball with six sets of double circles on each face of the sphere.

Like other toys, spinning toys were also had always been a popular item among the children, made of shell with copper tip. For longer spin, may be for rich community and terracotta's one for lower community.

MAN, WOMAN AND CHILD FIGURINE

Most of the scholars and researchers believe that women and male figurines represent the fertility cult and mother goddesses etc. but simultaneously it could be the part of the children world. As it has been discussed that all the birds, animal, composite animals, toy-carts, etc. were in use of children, then their world would remain incomplete in the

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**MYTHOLOGY
&
RELIGION**

MESOPOTAMIAN AND INDUS VALLEY INTERACTION IN MATTER OF RELIGION

Abdul Aziz Farooq

'Man', says Paul Hutchinson, is a religious being. His religion has taken endless forms. His names for gods and goddesses are numerous beyond counting. The rituals through which he has sought protection or blessing vary from the horrible to the sublime..." Paul further eulogizes that man has worshipped and has often shown a belief that he possesses an immortal soul."

The scholars have divergent views as to when the images were modeled as cult of worship. But since the art was closely associated with the form of worship, it might have developed in very remote past. The field investigations in the Kachi-Sibi plain at the foot of the Bolan Pass have brought to light conclusive evidence of human settlement at Mehrgarh in 7000 B.C. where they erected mud-brick houses, harvested the barely and hunted the animals. Besides the beautiful pottery, their consummate skill in producing the male and female terracotta figurines was notable. The figurines were adorned with necklaces and complicated hairdo, which may have some association with the religious system perhaps a fertility cult to which are attached the nicely modeled figurines of bulls.

The study of the religious art of Harappan Culture in the 3rd millennium B.C. reveals the concept of Mother goddess. The excavations at Harappa, Moenjodaro and Chanudaro have yielded numerous terracotta female figurines, practically nude, "save for a very abbreviated skirt secured by the girdle round the loins" These female figurines having full breasts, bedecked with jewelry, fan-shaped head-dress with heavy hips and thin waist have been identified as those of Mother goddesses. The cult, says E.O. James, "was so essentially a product of its environment at a critical juncture in the transition from hunting and food gathering to agriculture and herding" The objects having striking resemblance to those of Mother goddess have been found at Jericho, Iraq Anatolian, Iran and Elam, Transcaspia, Egypt and Eastern Mediterranean.

The terracotta figurines with prominent breasts, circular eyes, owl-like nose and a slit marking the mouth found from Dabar Kot, Periano Chundai, Sur Jangal and Mughal Ghundai have been assigned to third millennium B.C. In style and features they are so uniform that Prof. Piggot regards them as "a grim embodiment of the Mother goddesses, who is the guardian of the dead and under world deity concerned alike with crops and the seed corn buried beneath the earth. The carving of a phallus at Mughal Ghundai and vulva depicting in the neighbouring-hood of the Perian-Ghundai shows that they had a fertility significance.

The cult of Mother goddess is regarded as the guardian of the village and house, presiding over child birth and domestic affairs. It seems that the deity have been



Terra Cotta Figurines
Mehrgarh - Baluchistan

preserved in the niche in the wall of almost of every house and also in dwellings and streets of the principle sites of Harappan culture as Tutelary divinities. The seal from Harappa depicting a plant issuing from the womb of a female deity represents the Mother Goddess as being "the goddess of fertility."

The appearance of a nude male horned deity, portrayed on a seal, as a three faced god in the yoga posture between four animals is a prototype of the historic Siva as he is considered as Lord of Beasts - "Passupati. The frequent appearance of the bull in the art of the Pre-Aryan period suggests its sacredness and possible connection with religious cult, as Bull was the common god, worshipped in Madian, where Hazrat Shoaib was preaching the unity of Allah.

It is an established fact that the Harappans have trade relations with Mesopotamia, where the triad as those of SIN, SHAMASH and ISHTAR or ANU, ANLIL and EA were the supreme ritual cults. Similarly a steatite seal from Moenjodaro establishes the worship of a deity and the accompanying seven ministrants may be the seven planet and the deity as New Moon.

The discovery of large number of steatite seals, tablets of terracotta and bronze containing the central figures of bull, lion, elephant, rhinoceros, unicorn and other creatures with pictographs suggest that they may be associated with the religious believes of Harappan. As the Brahmanical god and goddesses are normally escorted with their "VAHANA" or carrier like bull with Siva, lion with Parvati, elephant with Indra, lamb with Sarasvati, duck with Brahama and Garuda with Visnu. Even the rat is the vehana of Ganesha. There is a possibility that the concept may have been inherited by them through the traditions, which even continue for centuries even if they are alienated in their area of origin. A number of gods of the time of Noah like WADD, SUWA, YAGUTH, YAHQ and NASR continued to be worshipped in the Arabian peninsula till the conquest of Makah-tul-Mukkarama by he Holy Prophet (PBUH) in the 8th year of Hijra. Some of the icons were brought by AMER BIN LOHI from red sea to the port of Jeddah and enshrined them at Ka'aba, which became one of the biggest sanctuary of idols.

The Great flood of Noah's time devastated every thing as Hazrat Noah prays to Allah in Surah Noah (26) "O my Lord, leave not of the unbelievers, a single one on earth." Then Surah Ibrahim (9) says "Has not the story reached you (of people) of those who (went) before you? Of the people of Noah, and AD & Thamud and those who (came) after them. To them came Apostles with clear (signs)..... and in Surah Furqan (38) "As also "AD & Thamud, and the companions of the Rass and many a generation between them" and then in Surah Qaf (12) says "Before them was denied (the hereafter) by the people of Noah, the companions of Rass, the Thamud".

The Quranic chronological index shows that after Noah AD, Thamud and companion of Rass followed them. This was the period when Harappan civilization was at its zenith, adopted a number of gods and goddesses but unlike Mesopotamia no monumental building closely resembling to a temple or worship house have been encountered from the so far excavations carried out at the principle sites of Harappan cities. The high mound at Moenjodaro on which Stupa was built by the Buddhists in the second century A.D. may be a high seat like Ziggurat of Mesopotamia. This is just a conjecture while studying the other edifices around like divinity street, Great Bath, double ringed well, oval shaped well and bath rooms.

While analyzing the settlements of third millennium BC. We come across to Sumerian Civilization, Egyptian Civilization, and well established administrative seats at Madian and Hejaz. During the exchange of commercial commodities there should have been a frequent interchange of persons from one region to another. Hazrat Ibrhahim who was born at Ur was said to be contemporary of Hamurabi and some other opine differently with variation of dates of few years but definitely in the beginning of third millennium B.C. The destruction of companions of Rass (people of well) is discussed in Quran. The commentators of Quran identify the well in Aizerbaijan but at that time Moenjodaro civilization was not known and, therefore, serious efforts are required to identify the Rass. The scholars have identified one HANZKA BIN SUFAN as Apostle of Allah, who was sent for the guidance of companions of Rass. In the presence of conclusive evidence of trade relations of Harappans with Sumerian, it is definite that the message of "DIN-I-HANIF" reached here and people may have embraced new religion. The visit of missionary people can not be ruled out in view of the best navigational activities of Arabs.

Hazrat Ibrahim was born in the house of Azar the famous sculptor and the priest of the idol house. In such circumstances as portrayed in Surah Ana'm (76,77 & 78) Hazrat Ibrahim said and considered as STAR at night his Lord, then to MOON as the Lord and also the rising Sun. When they all set, then Ibrahim said "I HAVE SET MY FACE FIRMLY AND TRULY TOWARDS HIM WHO CREATED THE HEAVENS AND THE EARTH, AND NEVER SHALL I GIVE PARTNERS TO ALLAH."

While concluding the religious believes of Harappans that they consider the solar system as supreme, worshipping the Mother goddess, tree worshipping but definitely followers of DIN-I-HANIF, who may be few in number, but when the believers too adopted the ways of infidels we see the destruction in 1500 B.C. As Surah Ibrahim (13) says "VERILY WE SHALL CAUSE THE WRONG DOERS TO PERISH.".....

MYTHOLOGY IN THE ART OF INDUS VALLEY CIVILIZATION

Misbah Rashid

The pictographic script on the seals of Moenjodaro and Harappa (Marshall, 1931 & Vats, 1940) is undeciphered so we cannot say with conviction as to what was their religion. There are many anthropomorphic and zoomorphic designs, reliefs and statuettes which help in knowing their religion, beliefs and practices.

Myth is a dramatic illustration of recording migrations, invasions, conquests, cultural and social exchange, and admission to foreign cults. Man gave graphic answers to the questions he wondered about. The mystery that haunted him was birth and death. In order to understand the universe he created gods, goddesses, heroes and all hagiological legends. Their myths justified social system and narrated the traditional rites and customs. Myths never stayed static but were remodeled according to the needs. This change was due to many factors – trades, politics, invasion etc. It is through mythological subject matter the ancient arts that we come to learn about these civilizations.

Myths are early science – finding answers and explaining what was around them. Myths developed when the world was young and man and nature lived in harmony. They had a strong connection with the trees, hills, seas and animals. Early man believed in magic; and that magic was the only way of getting things done. Polytheism was a way of life. To please the gods and escape their wrath he made human and animal sacrifice. In order to understand the natural phenomenon he created gods and this is how they understood the invisible by the visible.

In the earlier civilization of Egypt, Mesopotamia and Indus Valley the gods had no semblance of reality. The Egyptian and Western Asiatic gods were made of huge stones in human shape with heads of mysterious animals or animals with human heads. In contrast the sculpture of Indus Valley was small in size. The Greco Roman gods unlike the Egyptians, Mesopotamians and Indus were in the image of man. There were not grotesque rather beautiful as Homer puts it, "like a young man at the age when youth is loveliest" (Hamilton, 1969:16). The gods of the Olympus had human qualities; they laughed, made jokes, were angry and sometimes jealous, whereas laughter in the presence of an Egyptian Sphinx or the Assyrian Bull was inconceivable.

A large number of seals and figurines have been found from Moenjodaro and Harappa. Seals are found in hundreds, over 1200 of them have been found at Moenjodaro alone. Most of the seals were of steatite and square in shape. Round and cylinder seals and sealings with pictographic script, have also been found. The figures of animals have controlled realism along with stylization which is also the characteristic of Mesopotamia.

Fig - 1



Fig - 2

The muscularity of animals was highlighted. These reflect the keen observation of the stone cutter.

Whether the figures on the seals were secular or related to some mythology can be understood by the study of the arts of other contemporary civilizations. There was an interchange of ideas and influences on the art of Mesopotamian and Indus Valley. A great deal of information about Mesopotamian mythology exists which helps us to understand the art of the Indus Valley. Seals discovered at Tel Asmar Kish and Ur (Wheeler, 1972:144-120) represent Indus Valley animals, such as elephant, rhinoceros and buffaloes.

Many terracotta and faience figures are found from the Indus Valley (Fig.1). Most of them are found on the seals. Animal statuettes are also made indicating some form of religious cult as many animal cults were practiced in ancient times. The animals mostly seen in their art were the bull, buffalo, elephant, rhinoceros, tiger, monkey, dog, squirrel, turtle, deer, sheep (rarely) and birds (Fig.2).

Worship of zoomorphic gods and animal headed gods was also much in practice in the ancient times. On the Indus Valley seals 'unicorn' (Fig.3) is mostly depicted, religious motive is suggested. It has a 'manger' in front of it. This is also seen in front of other animals – bison, elephant, rhinoceros and tiger for the purpose of offering of food or incense. This was a religious act as practiced in those times.

The bison with wrinkled neck, with a 'manger' in front and the bull with a hump are also depicted on the seals. The strength and vigour of the animals has been captured.

Four seals show a tiger looking at a man in a tree, which he holds with one hand while he extends the other. All these subjects seem to be part of mythology as there is nothing about hunting in it. Crocodile is also seen on a number of seals. The scaly hide is represented by hatching or dots.

Two seals show a three-faced head wearing a horned headdress with a vertical central feature. The arms are laden with bangles from wrist to shoulder like the 'Dancing Girl' (bronze).

On one of the seals, a figure is shown surrounded by animals. On the right is an elephant and a tiger and one the left of the figure is a rhinoceros and a buffalo. Below the stool on which it sits are two antelopes. (Fig.4-A). The man is in a squatted position as if in a 'yuga' position. The figure seems to be a deity who rules all life this is symbolized by the



Fig - 3



Fig. 4a



Fig. 4b



Fig. 4c



Fig - 5

depiction of animals. In ancient arts the depiction of animals showed the strength and the power to rule the beasts and many myths were related to this.

An animal with three heads is depicted. These figures are mythological. The imagination was vivid and interesting details have been captured by the stone-cutter (Fig.4-B).

In another seal from Moenjodaro a very interesting subject is depicted (Fig.4-C). In the upper register a deity in a pipal enclosure is shown with a kneeling devotee and an animal probably brought for sacrifice. In the lower register are seven human figures. Here it is worth noticing that human figures were not handled with the skill in which animals were made. The interest of these figure seals lies in their subject matter rather their ingenuous artistry.

On one of the seal a pipal tree is shown and from its base spring two highly stylized 'unicorn' (Fig.5-A). Such subject was not made just for sheer pleasure but were certainly related to some myth as was practiced in Mesopotamia and Egypt.

From Moenjodaro in another seal – a nude deity with a worshiper. A human faced goat stands behind the worshiper. Below are probably seven clothed votaries.

A horned tiger appears on one of the seals. This too must be a mythological scene as a bull-man figure is seen attacking it; reminiscent of the Sumerian 'Minotaur'.

Another composite figure shows six animal heads – 'unicorn', bison, antelope, tiger, while the other two are broken.

Moenjodaro seals also show a man probably a hero (Fig. 5-B), with his out stretched hands holds back two rearing tigers. This is similar to a cylinder seal from Ur. 2700 BC (Fig.6). A hero fights a bull, and a 'minotaur' fights a lion.

Another such subject is the cylinder seal from Akkad showing 'Gilgamesh' in Conflict', 2340-2180 BC (Fig.7), this great Sumerian hero fights the celestial bull which was sent against him by the goddess Ishtar after he had repulsed her advances. Repetition of the scene is done for the sake of symmetry.

In another seal from Akkad "Two episodes from Gilgamesh's life" are show (Fig.8). On the left he and his friend the half man-bull, Enkidu are shown fighting a lion. Lion fights were an act of valor with the people of these regions. On the right is the second episode in which 'Gilgamesh' is shown crossing the waters of Death in the boat of Urshanabi in search of the dead companion (Mythology,1983:58). Such scenes were common in the



Fig. 5b



Fig. 6



Fig. 7



Fig. 8



Fig. 9



Fig - 10

art of Mesopotamia. Gilgamesh the hero has been immortalized in poems, literature and art works.

In another Akkadian cylinder seal 2340-2180 BC Gilgamesh is with two gods (Fig.9) In the center, twin figures of the hero hold a gatepost. In the center is a water god, with two streams gushing from his waist, he stands in a shrine surrounded by water. This is possibly a representation of the water god Ea, in his dwelling. On the left is a deity in an attitude of worship. The depiction of all such figures was related to mythology and those of Indus Valley cannot be without such an aim.

Bull worship was widely practiced in the Middle East. Bull was a much-revered animal. It may have been worshiped as it helped in farming and was a symbol of strength. Different cults may have been associated with it. The bull was also sacred in Mesopotamia for example Bulls Head from the sound box, 2600 BC (Fig.10). Here the bull was considered as a symbol of fertility. Its power fascinated the ancient man and he worshiped it. The beard may represent some supernatural amplification of the bull's power.

The top register of the sound box of the harp (Fig.11), shows the Sumerian hero Gilgamesh or god wrestling with two man-headed bulls. The contest of forces natural and supernatural in the ancient world is expressed as a struggle between animals and monsters. And man is shown overpowering these forces.

The ancient Egyptians also venerated all kinds of animals, birds, and reptiles. These were interred by the hundreds of thousands at Beni Hasan, many corpses can be found there (Mythology, 1983:43-47). The bull Apis was honoured and worshiped at Memphis where he was called 'the Renewal of Path's Life' (Mythology, 1983:43). Bull was the protector of artisans and artists. In 1850 at Saqqara vast subterranean chambers were discovered where mummified bodies of sacred bulls, after splendid funerals were buried. Robert Mond in 1972 discovered near Armant the mummies of Buchis – the sacred bull whom the Egyptians worshiped (Mythology, 1983:44).

On a Harappa sealing one side bears a figure seated with a group of animals on his left and on the right a tree below which is a tiger and on the other side a bull and a standing figure in front of a wooden structure, possibly a second figure at its entrance.

Another sealing bears on one side a central group of pictographs with two rearing and confronting animals resembling tigers, on one flank and on the other, a nude woman upside down giving birth to a plant; the other side has the repetition of the pictographs and a seated woman with upraised arms, it could be a scene of human sacrifice.



Fig - 11



Fig - 12



Fig - 13



Fig - 14



Fig - 15



Fig - 16

Many terracotta female figures are found from the Indus Valley (Fig.12). Does this represent that they practiced fertility magic? These female standing figures are decked with jewelry and elaborate headdresses usually fan-shaped or a pannier on either side, probably an incense burner or for burning lamp oil. They wear a wide girdle, often with a loincloth. We can say that she is a goddess of fecundity. If we probe in the history of art we find many fertility goddesses from prehistoric and ancient times. The swirling breasts and bulging belly and thighs were a visible sign. The anatomical exaggeration of such figures served as fertility fetishes therefore, there was no need for realism. Indus Valley female figures seem to be related to fertility cults. A figure in which a mother nurses her child is found from Harappa (Fig.13). From Mehrgarh IV (Jarrige, 1988) we have female figures (Fig. 14). We can say that the female figures were related to fertility. Here we can also derive that a man, no matter where he lived, developed his concepts about nature and its phenomenon in the same manner and therefore, his artistic approach was also similar.

The Indus Valley figures can also be votive figures, as their modeling is done in a crude manner, and their eyes are made large similar to Sumerian Statuettes from the Abu Temple, Tell Asmar, 2700-2600 BC (Fig.15) which also have disproportionately large eyes. The eye fascinated the ancient man, the evil eye was feared and wide-open eyes were all seeing and vigilant. These figures with wide-open eyes had some association with supernatural powers. These probably represented worshipers, with tightly clasped hands across their chests in the attitude of prayer. These votive figures were in constant prayer to the gods. The male and female statuettes from Mehrgarh 8000 BC (Fig. 16), had wide-open eyes similar to the statuettes of Abu Temple. This not only proves there were visual similarities in the arts of Mesopotamia and this region but that these figures must have been votive figures related to some cult.

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**CONSERVATION
&
PRESERVATION**

SCIENTIFIC APPROACH TO THE CAUSES OF DECAY OF MOENJODARO AND ITS REMEDIAL MEASURES

Safdar Khan

Archaeological remains of Moenjodaro represent one of the most important urban center of the Indus Valley Civilization flourishing on the Western Bank of the River Indus, 30 Km. South of Larkana in Sindh. The city has invoked the interest of Archaeologists and Scholars alike as well preserved site in the chronological bracket of 2500-1500 B.C. Major part of this city was excavated by different Archaeologist, but under the over all guidance of Sir. John Marshal from 1920 to 1933, very professionally published in three monumental volumes entitled as Moenjodaro and Indus Valley civilization. Its Well planned houses, roads, streets, constructional materials are self explanatory about the dignity and civic sense of the authors of Indus Valley civilization.

Soon after its excavations the site has under gone a series of processes of disintegration and deterioration. The rate of deterioration of excavated part of city is painfully fast, according to the statement of the late Dr. Harold James Plenderleith in 1964.

"If the site is left unattended it will crumble within a span of 30 years:

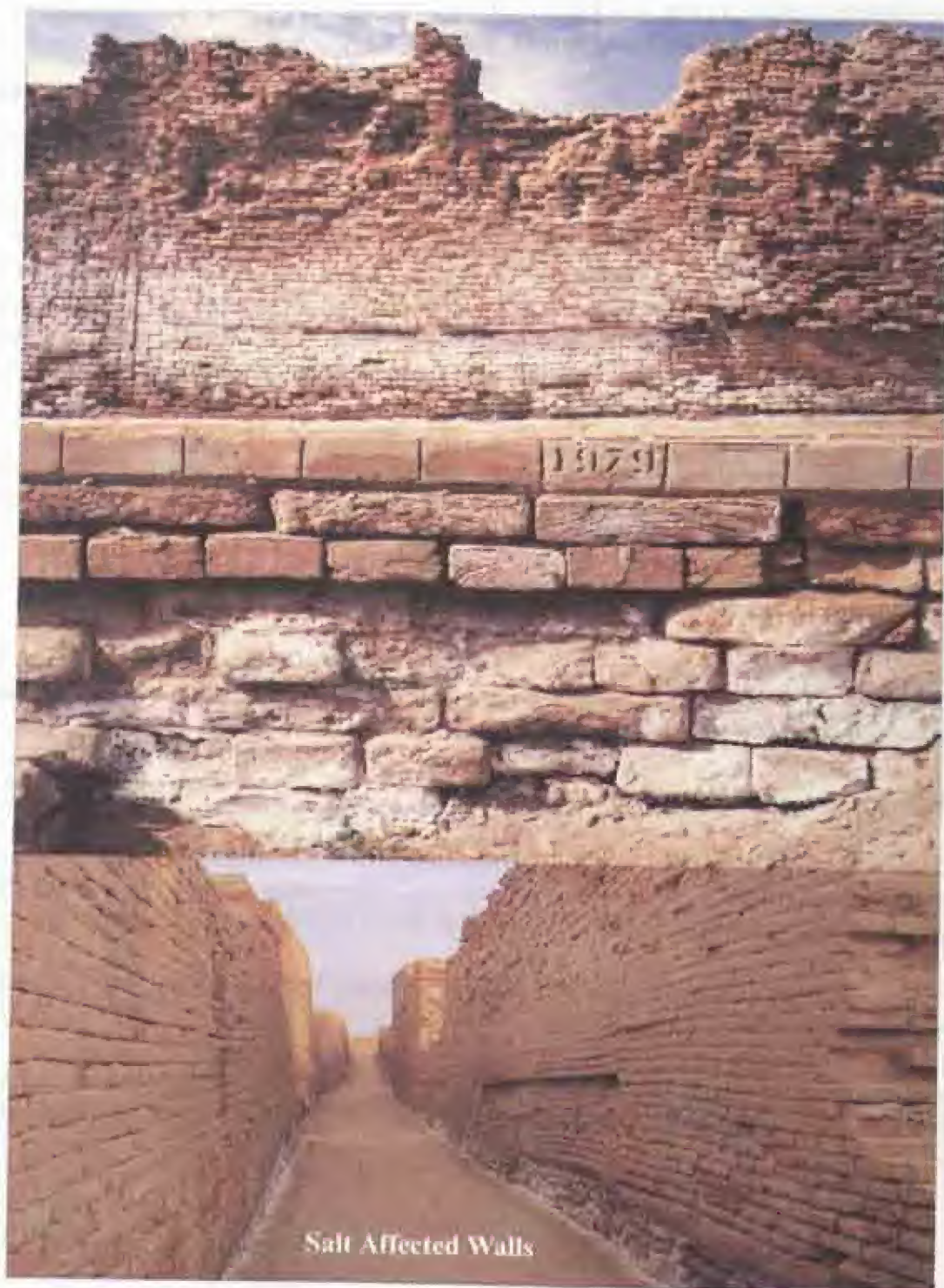
As a result of the efforts of Government of Pakistan, UNESCO has contributed much for the precautionary measures to arrest the deterioration factors and also for the restoration and conservation of damaged parts of the site.

CAUSES OF DECAY

The major part of the site has been built with burnt bricks of uniform size of 10"x5"x2.5" laid in mud mortar of considerable thickness and some times gypsum as mortars. Sun dried bricks also used as constructional material. Stone used for covering drains only.

The soil of Moenjodaro comprises of alluvial deposits brought by the river. The soil contains loam mud with layers of sand.

Water logging and salinity is said to be the main problems of Moenjodaro where as River Indus with its ever-shifting course and over flowing banks is also a threat to Moenjodaro remains.



WATER

There are numerous sources of water causing deterioration of this precious site.

- Due to River Indus, hazardous water level at the site always remains higher presently water of irrigation is also contributing much in rising the water table. It has been decided to lower the water table about 10 meters from the present condition of 45 m above Main Sea Level (AMSL). According to the experts it is most important for arresting the deterioration of Moenjodaro site, because pure water appeared mainly with stress caused at absorption state apart from transportation of salts.
- Rainwater is causing erosion of mud brick walls more simultaneously by the direct strike of raindrops, produce water ponds due to bad drainage system and also due to flow stream of water causing erosion at the edge of bricks. At some places foundation made by debris is eroding by the stream of rain water falling from above. Mud mortar easily eroded by rainwater.

SALINITY

The water due to capillary rise bring soluble salts into the brick masonry from the ground and on evaporation left salt over the surface of bricks (efflorescence) some times due to high rate of evaporation the crystallization takes place inside bricks (sub-florescence). Both the phenomenons cause deterioration of bricks.

SUB SOIL WATER TABLE

The archaeological remains of Moenjodaro are threatened by a number of destructive elements, one of which is the rise in sub soil water. According to the findings of Mr. W.O. Boekwijt the ruins of Moenjodaro are situated in a part of the Indus Valley where the ground level is about 47 meters (AMSL) while the maximum flood level of the river Indus near the site reaches to about 50 meters (AMSL). Dadu Canal generally flows at the level of 47 meters (AMSL). This clearly indicates that the Dadu Canal flows exactly at the same level as the general ground level of the site. The ground water table varies both in winter and summer due to which the capillary rise of water in the brickwork reaches upto 51 meters (AMSL). The general water table as recorded during 1990-2000 varies from about 41-45 meter (AMSL). (Fig.I).

SOIL SALTS CONTENT

Soil analysis of the samples collected from various depths at Moenjodaro site show the presence of the following salts:

Sodium, Potassium, Calcium, Magnesium, Carbonate, Bi-Carbonate, Nitrate, Nitrite, Chloride and Sulphate where as Sodium Sulphate and Sodium Chloride found in abundance. The analysis further shows that the quantity of salts decrease with the increase in depth. This further suggests that the salts content concentrate near the top soil due to evaporation. Salts concentration are in abundance up to 50 cm depth some times goes down to 100 cm depth of natural soil level. (Fig. II).

WATER SALTS CONTENTS

Water samples received from tube well MD-2, MD-4, MD-15, MD-16, MD-18 and MD-25 analyzed for total salts content show the presence of Sodium Potassium, Calcium, Magnesium, Carbonate, Bi-Carbonate, Nitrate, Nitrite, Chloride and Sulphate where as Sodium Sulphate and Sodium Chloride found in abundance. (Fig. III).

MOISTURE CONTENT BELOW GROUND

The analysis of soil samples collected from various bore holes from Moenjodaro show clear difference in moisture content. For instance the moisture content at the soil surface was found 0.4% to 0.97% while at a depth of about 3 meters the moisture content was found 28.28% which is almost the saturation point.

Moisture content data after closing of tube wells in September, 1997 was also recorded which suggest no change on sampling date Oct 06, 2000. The data agrees with the position of water table before closing of tube wells, which give us two thoughts.

- Whether during operation of tube wells a large amount of water percolate from the damaged parts of drain to the site.
- Whether during the period Sep. 97 to Oct, 2000 there was a general shortage of water in the area.

Proper data about the water level of River Indus AMSL near the site required along with the rainfall data for the period. (Fig.IV).

SOIL TEMPTURE

Soil temperature data collected during 1993-94 from 2 Nos. Bore Holes near piezo meter Nos: 4 & 8 using thermocouple wires and digital thermometer, shows different temperature at different times and depths. The temperature also varied during June, 1994 the temperature was recorded high upto 45 C° on the surface where as decreased upto 35 C° at the depth of 20 cm.

And at a depth of 100 cm the maximum temperature recorded at 31.6 C°. Similarly during January, 1994 the maximum temperature of the surface was recorded as 18 while

at depth of 20 cm, the temperature recorded as 20 C°. The temperature recorded at the depth of 100 cm was 22 C°

CLIMATIC CONDITIONS

The climate of an area brings undesirable changes in the Physical, Chemical and Biological properties of the monuments in the area. Climate of an area includes temperature, relative humidity and atmospheric pollution. It is observed during my stay at Moenjodaro WASIL that temperature of the site fluctuate from 4 C° in winter to 46 in summer. Diurnal fluctuation of temperature is more than 20 C° also diurnal fluctuation of R.H. is quite high. During winter due to low evaporation rate salts from, white crystals over the surface of brick masonry particularly on northern side and western side, some times eastern side depend on low evaporation and under shade walls and up to 1 meter height from existing ground level. The said phenomena take place at 32.8 C° more prominently. Where as in summer the crystallization takes place inside bricks surfaces due to high rate of evaporation, which results in falling apart pieces of bricks. During summer the process of evaporation is maximum which not only catalyze the process of salt crystallization but also causes shrinkage due to loss of water in the bricks and masonry.

Soil temperature noted at various bore holes at various depths and various times and seasons. There is quite difference in temperature on the surface, at depth of 20 cm, 50 cm and 100 cm during winter as well as summer. Ground soil temperature remains the same after the depth of 100 cm. Mud brick wall was also subjected to temperature monitoring at various depths during various seasons so as to analyze movement of temperature with in mud bricks. It was noticed that in regard to soil there was very small change and for very little depth in mud bricks. It was observed that the temperature fluctuation was only up to depth of 100 mm. Whereas after 100 mm depth in Mud bricks structure, temperature change was found negligible. We can assume from the data that temperature can not go deeper than 100 mm in mud bricks.

ILL PLANNED EXCAVATIONS

In various one sided excavated walls, it has been observed that there is horizontal pressure of the soil from un-excavated side while the evaporation rate of moisture on exposed portion of wall is greater than the un excavated side. As a result the damage on the exposed side is more prominent than unexposed side. In various excavated walls the top is not well protected hence various deteriorating factors responsible for the damage of the top of the wall can easily operate. These factors include the natural vegetation, sunlight, inside rain, and vandalism etc.

DAMAGE CAUSED BY THE VISITORS

Almost in all places, the visitors walk frequently even in the prohibited areas, therefore, due to unplanned tourists, the visitors damage surfaces of the masonry. In case of Mohenjodaro even the visitors' climb over the Mud brick structure of Stupa that is badly eroded mostly due to human effect than other natural, biological or climatic effect.

PREVIOUS CONSERVATION TREATMENTS

The methods of conservation inadequate and have not been scientifically controlled so previous treatments itself have become a deteriorating factor at some places.

Due to less know how a large number of original structures have been replaced by new material. Scientific work mostly carried out by labourer, less qualified people without proper planning and supervision. In some areas decayed bricks from the base of walls removed for replacement with new ones but due to unknown reasons left unattended resulting in collapsing of the whole wall or disturbing the balance of the wall. Damp proof course (DPC) application of pre cast concrete slabs coated with bitumen above ground level to block capillary rise of water, that result transportation of soluble salts from subsoil ground to the structures. The DPC instead of lowest level of ground applied 2-8 brick courses above ground level which increased the rate of disintegration of bricks that are below (DPC) because concentration of salts and humidity increased in that area. However, (DPC) is mostly having good results in keeping the sub soil water away from the upper/structure but it is really a destructive method. We should concentrate on non-destructive or micro destructive methods and stress upon preventive measures.

ANAYLSIS

The examination of the above results clearly show that various kinds of salts are found both in water and soil, but Sodium Sulphate and Sodium Chloride found in abundance, which are more fatal for the standing fragile structures. Another important phenomena which came to light is that the sub soil water level which fluctuate between 41 to 45 meters (AMSL) during different seasons of the year. This further tells that the sub soil water level almost remain constant below 2 meters from the surface. This position could, however, be true while the tube wells were in operation.

The available data shows that the sub soil water mostly remained 41 to 45 meters (AMSL) during the different seasons of the year. The moisture content in the soil taken from various levels also show variety in percentage but mostly the samples taken from the depth of about 3 meters during September, 1996 show almost 28.28% moisture content i.e. fully saturated.

The analysis of both water and soil samples also show high salts content of different kinds. The soil investigation shows that the quantity of salts decreased with the increase in depth. The salts content are at the lowest below the depth of 150 cm. Another notable point is that the salts content was found in lesser quantity in the water samples taken from the tube wells near the river Indus, and in large quantity from the tube wells samples installed towards paddy crops fields i.e. Dadu canal side. The analysis of soil temperature also shows variety due to change in seasons and even due to change in daily timings and also according to the depth. There is hardly any substantial change in temperature below 100 cm in the ground, similarly the temperature of Mud brick structures also recorded which show high temperature on the surface. The fluctuation in the temperature was noticed up to the depth of 100 cm in the structure but there was no change in temperature after the depth of 100 mm. These reading give us sufficient food for thought. Deterioration in material takes place due to change in temperature. If there is no change in temperature and it is regulated at constant level the danger of physical disintegration of the material is greatly minimized.

According to my opinion only lowering of water table does not mean that disintegration has stopped while the salt brought by this water get absorbed within the masonry and it causes deterioration by crystallization. After lowering of water table it is most important to desalinate the structures otherwise, the deterioration is multiplied as hydration and dehydration phenomenon will take place continuously.

For desalination of bricks for the time being and the research made to date is only the Mud poulticing method explained in the authors paper on "*extraction of salts using Mud poultice method from Moenjodaro structure*" published in journal of Pakistan Archaeologist Forum Volume No. 2 issue No. I & II 1993.

I will suggest that the process be continued in large scale utilizing Water and Soil Investigation Laboratory (WASIL) Moenjodaro facilities and expertise so that the extraction of salts is monitored at various stages qualitatively and quantitatively. This is easily available, inexpensive and conventional method normally used in the area without any skilled persons and sophisticated equipment. The process is reversible and no any drawbacks reported so far.

Where as for fragile bricks instead of Mud poulticing we can use Mud slurries so as to protect the surface of bricks as well as consolidate the surface of bricks. I think that this is the method to Put nature against nature if we use other poulticing material e.g. paper pulp etc. that will be better for moveable objects but for a site like Moenjodaro having walls more than 100 Km. In length is not practicable due to financial constraints. Washing with

water to eliminate salts also failed due to Mud used as mortar and providing high humidity to the foundation of structures at Moenjodaro site.

CONCLUSION

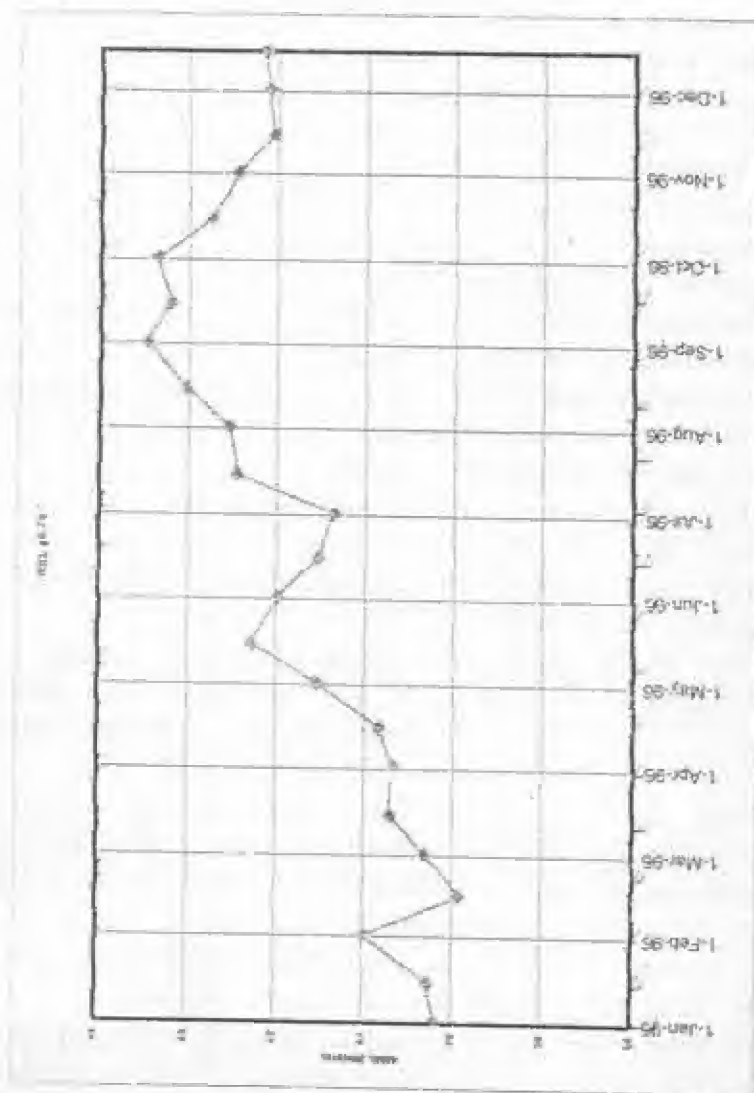
On the basis of available data it is difficult to reach any solid conclusion. However, on the basis of the data available, I suggest as under:-

- The temperature does not vary much after depth of 150 cm in the ground. In order to maintain a uniform temperature to stop/minimize capillary rise of sub soil water that results in transportation of soluble salts to surface. It is proposed that a buffer layer of sun dried/mud bricks be provided one experimental basis at one house to watch its effect, not only on the surface of the bricks so laid but also on standing structures. Laying of sun dried bricks on edge i.e. 6 inches deep over a layer of 6 inches sand on floors of houses/courtyards and the surrounding areas. After removal of salts laden earth to a depth 1 ft. (Site Engineer has to decide size and shape weather bricks on edge or flat be appropriate or mud mortar be needed or not). The bricks may be laid in proper gradient to ensure easy drainage of rainwater. The houses buildings desired to be given the proposed treatment may be conserved before hand. The decayed bricks maybe replaced with new ones as in practice. The loose joints may be cleaned properly and refilled with fresh mud mortar. The leaning walls may also be given proper support in order to check their sudden collapse. The side of walls where rainwater has access be provided with sun dried bricks protection to keep water away from structural foundation.
- Mud poulticing / Mud slurry application of the standing structures is essential to over come the problem of salts, rising the structure due to capillary actions as well as due to hygroscopicity and air born salts. It is essential to monitor the results of mud plastering and further to remove decayed mud plaster in time as leaving of saturated mud plaster over the standing structure may prove more hazardous. The process is continued and proper maintenance of Mud poulticing i.e. weakened, cracked and salt saturated poultice is changed quickly., The ingredient of mud plaster i.e. sand + mud or mud + straw +sand need to be calculated by the site engineer in the light of WASIL results. Mud plaster needs to be applied up to the height of sub-soil water in the structure or little above. Need no to apply above DPC level where DPC exists. Mud slurry should only be applied to the bricks that show salt efflorescence, powdering, as the same facilitate extraction of salts from bricks as well as consolidate the surface. Apart from the same, it will also be useful for application below DPC level instead of mud plaster.

- The salt content both in water and soils in the areas adjoining irrigated land are quite high. Mostly rice is cultivated on these lands for which abundant water is needed. These fields are inundated with standing water for weeks together as a result the salts on the surface migrate towards the structures. There is an urgent need for stopping cultivation of paddy crops to overcome the problem.
- Leaning walls be provided with support and proper scientific investigation be carried out to know the reason on the basis of scientific analysis remedial measures be suggested. Presently provision of support, consolidation of foundations, removal of earth from one side excavated walls, and ensuring proper drainage system is carried out.
- Strengthening and refilling of loosed architectural elements using the same mortars or modified with addition of some fibers etc. is carried out on regular basis and with proper documentation.
- Application of sun dried bricks on top of brick wall are continued so as to protect the walls from environmental factors apart from slurry coating. It should be done scientifically according to the width, position and load bearing capability of the wall.
- Latest non-destructive techniques of analysis needed to be applied for investigation of tilting walls, e.g. Tilt Monitoring Methods. Geophysical Survey about under ground Structure (Seismic Velocity, Electrical Receptivity) etc.
- Proper training of the personnel chemists, Engineers, Architects, Archaeologists, Physicists, Biologists, Conservators and providing necessary equipment, literature to enable them to work on the site and collect proper data and carryout further research.
- I will stress upon day to day maintenance, good watch and ward system of the site, which will keep the structures intact for posterity.
- One house unit will be conserved properly, doing all the conservation and protection measures. Piece meal treatment of various structures on large scale needs to be avoided, only the affected portion be attended, stress should be given to preventive conservation and non destructive micro destructive methods be applied.

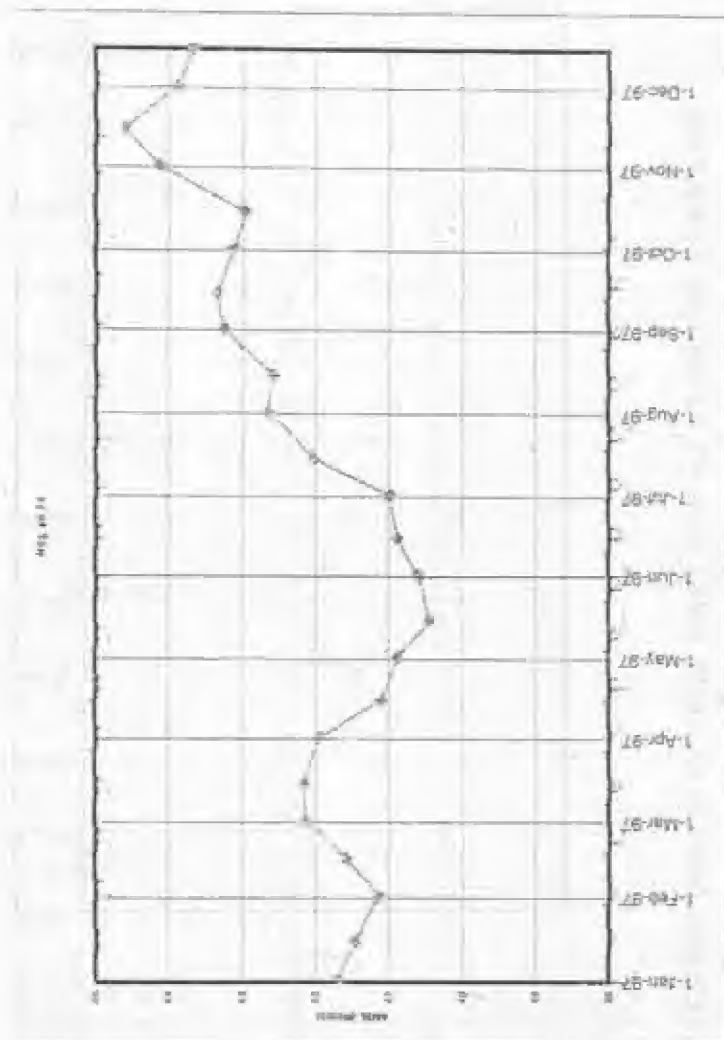
PIEZOMETER READING IN METERS AMSL FOR PZ-1 FOR THE YEAR 1996

Month	AMSL (meters)
1-Jan-96	40.19
15-Jan-96	40.28
1-Feb-96	41
15-Feb-96	39.92
1-Mar-96	40.31
15-Mar-96	40.71
1-Apr-96	40.68
15-Apr-96	40.83
1-May-96	41.53
15-May-96	42.27
1-Jun-96	41.89
15-Jun-96	41.53
1-Jul-96	41.95
15-Jul-96	42.45
1-Aug-96	42.54
15-Aug-96	43.03
1-Sep-96	43.48
15-Sep-96	43.21
1-Oct-96	43.36
15-Oct-96	42.75
1-Nov-96	42.45
15-Nov-96	42.05
1-Dec-96	42.11
15-Dec-96	42.14



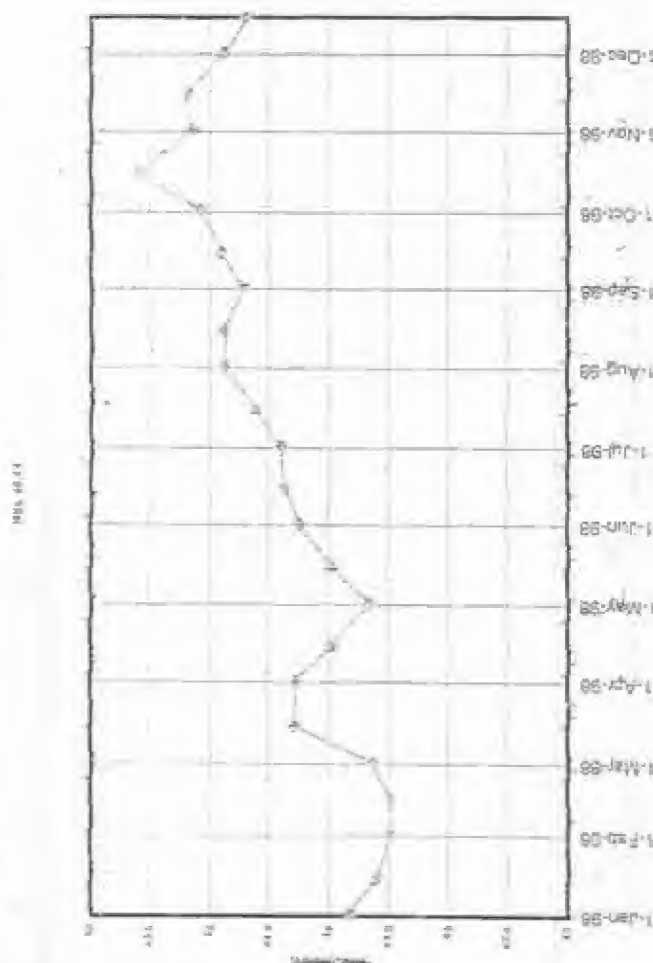
PIEZOMETER READING IN METERS AMSL FOR PZ-1 FOR THE YEAR 1997

Month	AMSL (meters)
1-Jan-97	41.69
15-Jan-97	41.47
1-Feb-97	41.14
15-Feb-97	41.66
1-Mar-97	42.14
15-Mar-97	42.17
1-Apr-97	41.96
15-Apr-97	41.11
1-May-97	40.69
15-May-97	40.44
1-Jun-97	40.69
15-Jun-97	40.89
1-Jul-97	40.98
15-Jul-97	42.04
1-Aug-97	42.65
15-Aug-97	42.6
1-Sep-97	43.27
15-Sep-97	43.35
1-Oct-97	43.11
15-Oct-97	42.97
1-Nov-97	44.12
15-Nov-97	44.6
1-Dec-97	43.88
15-Dec-97	43.67



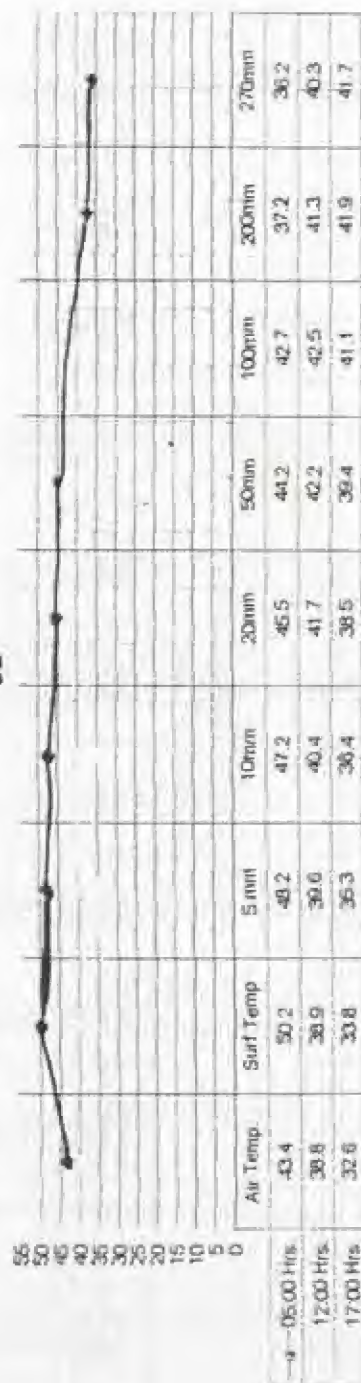
PIEZOMETER READING IN METERS AMSL FOR PZ-1 FOR THE YEAR 1998

Month	AMSL (meters)
1-Jan-98	43.84
15-Jan-98	43.6
1-Feb-98	43.48
15-Feb-98	43.48
1-Mar-98	43.63
15-Mar-98	44.28
1-Apr-98	44.27
15-Apr-98	43.87
1-May-98	43.67
15-May-98	43.87
1-Jun-98	44.24
15-Jun-98	44.37
1-Jul-98	44.4
15-Jul-98	44.61
1-Aug-98	44.88
15-Aug-98	44.88
1-Sep-98	44.73
15-Sep-98	44.91
1-Oct-98	45.07
15-Oct-98	45.59
1-Nov-98	45.15
15-Nov-98	45.19
1-Dec-98	44.89
15-Dec-98	44.7

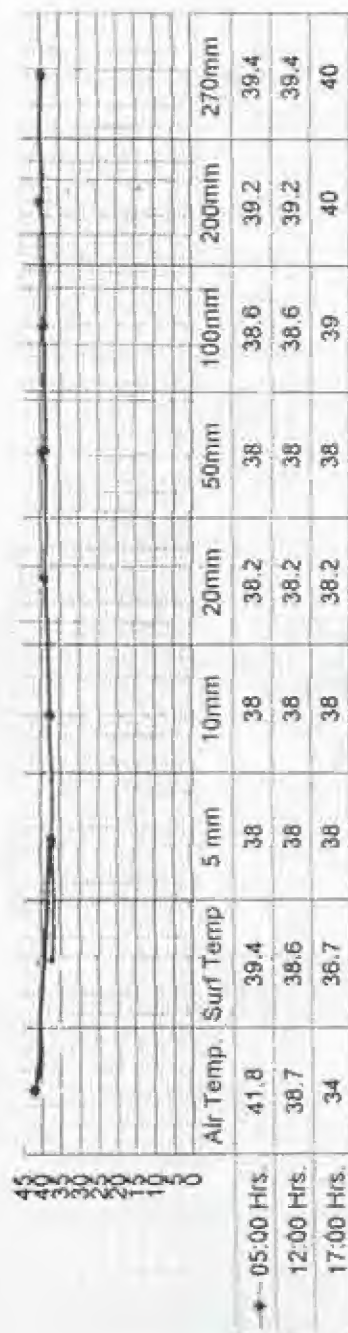


Temperature Data in Mud Brick Structure (External) at Moenjodaro on dated 10-06-

92



Temperature Data in Mud Brick Structure (Internal) Moenjodaro on dated 10.06.92



ANNEXURE - II
SOIL SAMPLE ANALYSIS FROM MOENJODARO
(HOLE NO-3)
sampling date 6th OCT, 2000

Lab. No	Source depth	pH	Conductivity (μmhos/cm)	TDS (mg/L)	Na ⁺ (mg/L)	K ⁺ (mg/L)	Ca+Mg (mg/L)	HCO ₃ ⁻ (mg/L)	Cl ⁻ (mg/L)	SAR	CO ₃ (mg/L)	NO ₂ NO ₃ SO ₄ (mg/L)
27	Surface	8.1	167	116	220.11	68.03	23.46	24.04	264.81	4.04	606	Not detected
28	20 cm	8.1	13.8	91.97	182.08	72.33	127.03	106.36	92.364	7.4	606	100
29	40 cm	8.2	8.83	61.57	189.96	86.02	358	108.60	170.96	8.7	606	100
30	100 cm	8.2	4.40	41.81	115.08	82.13	96.08	246.48	117.13	5.2	606	100
31	150 cm	8.8	4.30	0.23	120.06	28.65	27.35	172.82	106.38	8.4	606	100
32	200 cm	8.7	19.0	1.56	189.68	95	183.51	183.51	136.62	11.3	606	100
33	250 cm	8.9	20.0	1.47	108.04	106.45	43.29	311.59	415.52	15.4	606	100
34	300 cm	8.7	23.5	2.31	108.09	220.53	31.89	126.90	329.36	42.7	606	100

ANNEXURE - II
SOIL SAMPLE ANALYSIS FROM MOENJODARO
(HOLE NO-3)
sampling date 6th OCT, 2000

Lab. No	Source depth	pH	Conductivity (μmhos/cm)	TDS (mg/L)	Na ⁺ (mg/L)	K ⁺ (mg/L)	Ca+Mg (mg/L)	HCO ₃ ⁻ (mg/L)	Cl ⁻ (mg/L)	SAR	CO ₃ (mg/L)	NO ₂ NO ₃ SO ₄ (mg/L)
35	Surface	8.2	89.6	67.96	2069.99	641.24	265.33	113.06	2064.12	80.3	606	Not detected
36	20 cm	8.1	59.5	8.57	2080.03	723.31	494.01	83.63	1987.99	24.2	606	100
37	40 cm	8.6	26.2	1.66	1249.89	286.69	439.08	23.21	1102.91	15.9	606	100
38	100 cm	8.7	15.3	0.61	118.84	347.61	118.84	82.93	673.74	7.1	606	100
39	150 cm	8.2	15.9	0.08	198.53	198.16	189.16	84.80	449.79	7.6	606	100
40	200 cm	9.2	12.2	0.87	209.96	72.31	29.68	176.93	136.83	15.7	18.0	100
41	250 cm	9.3	11.0	0.39	169.93	66.07	17.03	136.94	324.29	17.8	36.8	100
42	300 cm	9.6	11.4	0.81	189.81	30.10	21.10	140.42	179.14	6.6	23.20	100

ANNEXURE - II
SOIL SAMPLE ANALYSIS FROM MOENJODARO
(HOLE NO-4)
sampling date 6th OCT, 2000

Lab. No	Source depth	pH	Conductivity (μmhos/cm)	TDS (mg/L)	Na ⁺ (mg/L)	K ⁺ (mg/L)	Ca+Mg (mg/L)	HCO ₃ ⁻ (mg/L)	Cl ⁻ (mg/L)	SAR	CO ₃ (mg/L)	NO ₂ NO ₃ SO ₄ (mg/L)
43	Surface	8.6	154.2	11.0	1740.03	816.24	388.41	244.04	3529.64	45.87	606	Not detected
44	20 cm	8.6	78.5	5.37	2080.01	411.83	379.76	126.08	2127.89	29.3	606	100
45	50 cm	8.7	64.7	2.46	689.07	264.95	361.73	104.29	2058.84	10.11	606	100
46	100 cm	8.9	18.0	1.28	601	451.70	63.47	63.47	802.87	6.0	606	100
47	150 cm	8.9	23.3	1.87	329.92	247.81	212.82	45.41	945.09	10.0	606	100
48	200 cm	8.8	19.4	1.41	384.08	120.43	380.46	106.16	918.17	10.7	606	100
49	250 cm	8.7	11.8	0.81	290.01	72.31	45.40	120.80	267.80	10.2	606	100
50	300 cm	9.0	20.0	1.22	539.98	112.44	51.90	139.19	468.15	3.91	11.02	100

Annexure - II
SOIL SAMPLE ANALYSIS FROM MOENJODARO
(BORE HOLE NO.4)
sampling date 6th OCT. 2000

Lab. No	Source/Depth	pH	Conductivity µm/cm	TDS mg/L	Na ⁺ mg/L	K ⁺ mg/L	Ca+Mg mg/L	HCO ₃ ⁻ mg/L	Cl ⁻ mg/L	SAR	CO ₃ Mg/L	SO ₄ NO. 3 SO ₄ mg/L
51	Surface	8.4	151.5	9.32	—	102.44	4.92	119.56	4004.83	—	mg/L	Not recovered
52	20 cm	8.6	55.8	3.95	24.31 mg/L	3.22.81	—	98.28	21.45.34	4.2.4	500	Ex.1
53	30 cm	8.6	51.7	2.39	13.19 mg/L	1.76.34	12.7.45	144.66	1569.64	5.2.1	300	Ex.2
54	150 cm	8.6	26.6	1.89	—	96.19	97.304	130.24	673.24	—	300	Ex.3
55	150 cm	8.8	5.13	0.46	16.08	20.03	44.09	300.14	134.73	6.6	300	Ex.4
56	280 cm	9.1	8.2	0.58	189.98	65.19	41.28	136.89	226.84	9.2	300	Ex.5
57	250 cm	9.2	9.4	0.71	101.08	11.90	10.68	163.26	141.84	14.0	200	Ex.6
58	300 cm	9.6	1.9	0.13	69.93	19.44	15.31	270.00	56.74	0.4	Trace	Ex.7

Annexure - III
MOENJODARO TUBE WELL WATER ANALYSIS
SAMPLING DATE 10-09-1996

No	Source	pH	Conductivity µS/cm	TDS mg/L	Na ⁺	K ⁺	Ca++ mg/L	Mg++ mg/L	HCO ₃ ⁻ mg/L	NO ₂ mg/L	NO ₃ mg/L	Cl ⁻ mg/L	CO ₃ mg/L	SO ₄ mg/L
1	2	8	4	8	8	7	8	9	10	11	12	13	14	15
1	MD-4	8.0	1380	1.26	5.815	—	10.62	—	6.0	0.07 mg	16.12	14.06	5.75.15	3.50
2	MD-2	8.0	1990	1.52	Do	Do	11.07	—	6.09	0.1419	1.64	13.17	5.80	5.50
3	MD-15	7.7	910	1.94	Do	Do	11.19	—	6.6	0.1754	10.11	10.44	1.50	9.00
4	MD-9	7.9	2968	2.49	Do	Do	13.68	—	6.02	0.0987	7.92	22.08	1.50	8.80
5	MD-16	7.7	1253	1.19	Do	Do	3.69	—	6.05	0.1787	7.92	11.67	3.53	4.50
6	MD-18	8.0	511	0.34	Do	Do	1.68	—	6.02	0.0894	25.44	1.04	1.50	1.5
7	MD-15	7.8	1235	0.23	Do	Do	1.04	2.99	2.08	0.0590	6.6	7.85	1.50	3.60

A/S Dr. Arjun Kumar

Annexure IV
MOISTURE CONTENT DATA OF SOIL SAMPLES COLLECTED
FROM VARIOUS BORE HOLES AT MOENJODARO 06th OCT. 2000

HOLE NO.1		HOLE NO.3		HOLE NO.4		HOLE NO.5	
Lab. No.	Depth MC %	Lab. No.	Depth MC %	Lab. No.	Depth MC %	Lab. No.	Depth MC %
210	Surface - 1.14	322	Surface - 8.46	323	Surface - 12.96	314	Surface - 17.23
209	30 cm - 6.54	307	20.30 - 1.08	324	10.26 - 23.28	315	30 cm - 26.57
300	50 cm - 8.53	308	50 cm - 14.76	224	0.00 - 23.02	316	30 cm - 18.55
301	100 cm - 4.51	309	100 cm - 4.10	325	138.00 - 16.95	317	100 cm - 29.04
302	150 cm - 2.36	310	150 cm - 15.26	326	250.00 - 10.36	318	150 cm - 15.46
303	200 cm - 10.00	311	200 cm - 10.00	327	200 cm - 13.04	319	200 cm - 19.00
304	250 cm - 10.92	312	250 cm - 17.01	328	250 cm - 24.43	320	250 cm - 4.86
305	300 cm - 27.2	313	300 cm - 18.24	329	300 cm - 27.28	321	300 cm - 24.63

GENERAL PROPOSAL

ARCHAEOLOGICAL RESEARCH CENTRE AT HARAPPA

Rizwan Azeem

PROPOSAL

The Harappa Archaeological Research Center will be established within the Department of Archaeology to extend cultural resource research and management services for public and private agencies and organizations. These services include cultural resource management studies, archaeological testing and excavation, architectural structure survey, evaluation and conservation, material culture analysis, historical research and interpretation, and a wide variety of related technical services. The Center will be staffed with professional archaeologists whose combined expertise encompasses both prehistoric and historic period sites and artifacts from Central Asia to Pakistan and beyond. The center's facilities include offices, laboratories, and collection storage with access to specialized computer and materials testing equipment.

RESEARCH CENTRE'S MISSION

The Harappa Archaeological Research Center is a project of University of the Punjab under the direction of the Department of Archaeology. In 2003 it will be moved to the permanent facilities at Harappa. The Center would provide opportunities for undergraduate and graduate students to participate in archaeological field work and laboratory analysis through field schools and sponsored research programs. Research activities of the Center will be sponsored by a number of provincial and federal agencies.

The mission of Harappa Archaeological Research Center is to explore, preserve, and exhibit the archaeological record of Indus Valleys human story for present and future generations. The Center will pursue a mission to discover and disseminate the unwritten story of ancient lifestyle, accomplishments, and changing natural environment. The Center fulfills this mission by supporting integrated programs of archaeological investigations, education all outreach, and cultural stewardship.

The Center will run and sponsor several programs:

- **Conduct an archaeological survey:** The provincial Department of Archaeology is charged with conducting the survey of archaeological sites in the Punjab. To this end, archaeological survey and excavation projects are to be carried out by Center personnel on various contracts with provincial and federal agencies to assist them in their cultural resource management obligations.

Additionally, the Center will conduct surveys and excavations funded through various grant sources.

- **Protect Indus Valley region's archaeological resources:** Harappa ARC will work closely with the provincial Department of Archaeology and federal agencies to carry out their cultural resource management obligations, to protect the unmarked human burials and remains and to preserve important archaeological sites in Pakistan. The Department of Archaeology will also be given expert advice for the review of permit applications for mining and mineral exploration, gravel pits, and oil and gas explorations. Recommendations are to be made as to what steps are necessary to protect archaeological resources.
- **Maintain records of archaeological sites in the Indus Valley regions:** The Center would keep A Database of information on all known archaeological sites in the region. Information on sites is provided by archaeologists working on federal, provincial, and private projects and by individual scholars. The Center will maintain files for archaeology to provide the only centralized source of upto date information for conducting research in this region. The information to be stored includes a computerized database of sites, projects, and bibliographical references; files of original survey records; Survey of Pakistan 1:5000 scale maps of site and survey locations; and a research library.
- **Act as a repository for archaeological collections:** In addition to storing its archaeological collections, the Center will maintain a large repository of artifact collections belonging to various agencies. Accessioned collections are to be housed at the Center. Many would be small surface pickups, but many others represent the results of large-scale excavation projects with thousands or even hundreds of thousands of items collected. Along with the artifacts, the Center will maintain the entire catalogue records, field maps, drawings, notes, and photographs from the projects.
- **Promote awareness of Indus Valley's prehistoric and historic heritage:** The Center actively seeks to inform the public about regions long and colourful history. This is to be carried out through talks and demonstrations for schools, tourists and various civic organizations, assisting museums in preparing archaeological displays, artifact loans to museums and other qualified institutions, and an exhibit at the Archaeological Museum at Harappa.

The Harappa Archaeological Research Center (Harappa ARC) is one component of the broader Institute of Archaeology and Studies at the University of the Punjab. Under guidance from its director, the principal focus of the Harappa ARC is to facilitate faculty and student research via funding obtained from contracts and grants. The Center brings together considerable individual and team expertise in the management of cultural

resources. Professional expertise will be offered in prehistoric archaeology generally, with specialization in Field Archaeology, Applied Museology, Architectural History, Medieval Archaeology, Archaeobotany, Human Osteology, and flaked and ground stone analysis.

The Harappa archaeological Center (Harappa ARC) may be established in 2001-02 within the Department of Archaeology to provide archaeological consulting and research services and applied educational opportunities in cultural resource management. After its organization, the Center may receive over 25 research contracts and grants per year. Sponsors of projects include a variety of governmental and private agencies. The Center staff would grow to include a core of 10 professionals and a part time work force of 8 to 12 employees.

MUSEUM/GALLERIES/EXHIBITIONS

The permanent display of the cultural material from the region will be maintained at the Harappa ARC. Harappa Museum or galleries will contain collections from previous explorations as well as the findings from on-going research projects and excavations. Some of this material may be loaned to other museums for traveling exhibitions and displays.

PROJECT EXPLORATION, EXCAVATION, CONSERVATION

The Harappa Archaeological Research Center (Harappa ARC) will provide archaeological consulting and research services and applied educational opportunities in cultural resource management. After its organization, the Center may receive over 25 research contracts and grants per year. Sponsors of projects include a variety of government and private agencies. The Center staff would grow to include a core of 10 professionals and a part time work force of 8 to 12 employees. With its focus on the prehistoric and historic archaeology of the Indus Valley region, the Center will provide opportunities for undergraduate and graduate students to participate in archaeological field work and laboratory analysis through field schools and research programs. Research activities of the Center will be sponsored by a number of provincial and federal agencies.

Significant research contributions should also result from Center projects. Among these would be the study and reconstruction of the historical settlement at Harappa from the seventh through the twentieth centuries. Numerous projects at Indus Valley region would yield important information. A newsworthy project will be the conservation/reconstruction of the fortification of wall and gates of Harappa, built during the later periods.

An **Illicit Antiquities Control Unit** will function on the lines of the Illicit Antiquities Research Center in the UK with following objectives:-

The Illicit Antiquities Control Unit will be established in response to concerns expressed about the loss to our knowledge of the past caused by the illicit excavation of archaeological sites. It intends to:

- Raise public awareness in Pakistan and internationally about this issue and seek appropriate national and international legislation, codes of conduct and other conventions to place restraint upon it;
- Monitor the sale and transfer of illicit antiquities within the country and raise public awareness of the scale of such sale and transfer overseas;
- Develop an overview of the national and international legislation bearing on these issues;
- Argue, as a provisional measure, for the widespread adoption of the central tenet of the 1970 UNESCO convention on the illicit transfer of cultural property, that unprovenanced artifacts which cannot be shown to have been known and published prior to 1970 should be regarded as illicit and should not be acquired by public collections whether by purchase, gift or bequest nor exhibited by them on long-or-short term loan and should not be purchased by responsible private collectors. It should be recognized, however, that local or national museums may on occasion be the appropriate repository for such unprovenanced objects as can be shown with reasonable confidence to have originated within the territory of their responsibility.
- Seek agreement among national organizations and museums in the country on the appropriate policy for such bodies to adopt on the acquisition, display and publication of unprovenanced artifacts.
- Seek to co-operate with dealers and auction houses in furthering to evolution towards the understanding of such issues and the adherence to appropriate practices.
- Work with the Federal and provincial Departments of archaeology and other authorities to encourage the application of appropriate principles
- Investigate and make known illicit activities relating to antiquities in Central Asia, Iran, and Afghanistan, and to publish such information in the Research Journal;
- Establish working relationships with data-search organizations relating to stolen antiquities (i.e. Antiquities which formed part of a recognized

collection from which they were stolen) as well as illicitly excavated antiquities which have not, so far as is known, been recognized as forming part of a public collection or a major and well documented private collection;

- Promote educational measures, which will stimulate and develop respect for the archaeological heritage of all nations.

HARAPPA INSTITUTE OF INDUS VALLEY SCRIPT & LANGUAGE

A research and teaching institute may be established at Harappa ARC to attract local and foreign students/researchers interested in language, grammar, literature and allied studies. The institute will benefit from available facilities and services such as research library, museum, computer section and laboratories.

MONUMENT TO THE GREAT PEOPLE OF HARAPPA, PAST AND PRESENT

A site for the monument to the famous and historic personalities born or passed through the area around Harappa may be selected close to the facilities of Harappa ARC and visible from the main road, the present village/river bank. The architectural features of the phases of development at Harappa should be incorporated in the design of the monument. The celebrities such as Alexander, Timur, Akbar, Ranjit Singh, Rai Ahmad Khan Kharral, Sir Robert commemorating their deeds as inscriptions and visuals on the monument.

LIBRARY, COLLECTION, DATABASE AND PUBLICATIONS

The resource Center for the research will comprise of a selection of reference documents, research reports, journals and archives. The library will work in collaboration with larger libraries in Pakistan and abroad to furnish copies of the desired material for ongoing research projects and educational services. The material collected during the research work, exploration and excavations will be catalogued and stored with the joint efforts of the museum and the library. The archive section will be based on computerized database and storage facilities. The publication of newsletters, journals, reports, and other documents will be carried out at the library and its affiliated agencies at the University of the Punjab.

RESEARCH FACILITATION

The Harappa ARC will have facilities and equipment to support a full range of field and laboratory investigations. Office space equivalent to about 2,000 sq. ft. With additional Laboratory facilities at the Center will be equipped to conduct a host of analytical jobs, including lithic, faunal, soil flotation and macro botanical analyses.

The computer support will range from the data processing network to Plotting, Mapping, GIS, Cataloging, and remote connectivity. There will be appropriate facilities for photographic processing, recording, copying, manuscript printing, binding and other services useful for the library, research projects and educational and publication programs. The necessary arrangements of communication and transport will be made available for the logistics and services at the Center and at the project sites.

TOURIST RECEPTION FACILITIES

The facilities of one or two restaurants and adequate provision of restrooms for men and women will be included in the design parameters for the Harappa ARC. These facilities will be shared by the residents of the Center and an increasing number of visitors coming to the area for sightseeing and slide projection/audio-visual shows.

OPEN AIR MUSEUM, EXCAVATIONS AT HARAPPA

Museum normally denoted a building cultural material to which the public had access. During the last fifty years, however, as museums continued to respond to the societies that created them the emphasis on the building itself became less dominant. Open Air Museums, comprising a series of buildings preserved as objects, and eco-museums, involving the interpretation of all aspects of an outdoor environment, are becoming more common to highlight the areas of particular interest. Outdoor museums preserving traditional architecture, sometimes in situ, and often demonstrating the activities associated with them, are to be found in many parts of the world.

Open air Museum may comprise the significance sites at Harappa and neighboring areas with strong historical associations, archeological findings and tourism potential. The major attractions may include the cultural continuity, archaeological remains, and natural/scenic aspects of the area. The relevant notification and allocation of development funds by the local, provincial and federal agencies will then be utilized to establish necessary infrastructure and management setup for an Open-Air Museum. The pattern and guidelines for the similar facilities may be formulated from examples of Open air Museums at Gorame in Turkey, Jai Singh's Observatory at Jaipur, India and Den Gamle By-Aarhus in Denmark.

HARAPPA BAZAAR

One of the most interesting and lively places at the Harappa ARC complex would be the reconstruction of a typical bazaar according to the medieval architectural/archaeological evidences and historical accounts. The bazaar may be called Ravi-Harappa Bazaar. The shops will supply the desired daily commodities besides selling souvenirs to visitors.

There may be established special stores and shops for photographic supplies, view cards, replicas and models, local handicrafts, food items and the produce.

EDUCATIONAL PROGRAMMES FOR STUDENTS AND SCHOLARS.

The Harappa Archaeological Research Center (Harappa ARC) would offer both undergraduate and graduate students in Archaeology, Anthropology, Architecture, history, and Pakistan studies an opportunity for practical training in the growing field of cultural resource Management.

In conjunction with the offerings of the Department of Archaeology, students will gain an understanding of the applied aspects of cultural Resource Management Archaeology. These include participation in actual survey and excavation, specialized laboratory methods and research, curatorial and database management projects, preparation of archaeological reports for inclusion in Environmental Impact Statements, introduction to computer mapping and GIS, and directed artifact and historical research. The interdisciplinary nature of archaeological projects can be observed first hand through frequent contact with specialists from the fields of geology, marine science, computer science, chemistry, physics, and history. The Center would annually award two summer internships for studies in Regional Archaeology.

Consistent with the goal of providing opportunities for academic and practical training in the field of Regional Archaeology, the Center will continue to enhance and develop educational outlets. These include: Internships in Regional Archaeology (Indus Valley and Historical) that support graduate and undergraduate students during summer sessions through daily participation in supervised activities directly related to careers in Regional Archaeology. Completion of the internship will provide the student with a background in the process of Regional Archaeology and prepare participants for their continuing graduate studies and research and the job market. In the forthcoming years, the focus of internship research would remain on the site in the Punjab plains and neighbouring areas. Internships will also be available for undergraduate students during the university year. These internships are increasingly becoming popular elsewhere and will continue to be integrated into the Centre's overall educational program.

PRACTICING CULTURAL RESOURCES MANAGEMENT

A course designed to expose students to the day-to-day procedures of the cultural resource management endeavour, will be offered each semester. The course takes a hands-on approach through which students are exposed to the planning, proposal preparation, field and laboratory strategy, report preparation, and final review aspects of this work. The course will be a semester-long offering.

The Center may also initiate the 'Lifelong Learning Program', a continuing education program sponsored by the Pakistan Archaeologist Association and Institute of Architects Pakistan. Classes will be focused on the Historical Archaeology of the Indus Valley region and will include fieldwork projects at sites along the Indus River. These programs should candle a real interest among the members in local archaeological activities.

WORKSHOP, SERVICE FACILITIES, MAINTENANCE UNIT

The maintenance unit at Harappa ARC will provide basic and preventive maintenance and repair services. The workshop will support everyday maintenance jobs including electrical, mechanical, carpentry, building repair, auto and telephone servicing etc. Additional services and personnel may be asked to join during the exploration/excavation projects and on special occasions/tourist season.

IRAN'S CONTRIBUTION IN INDUS VALLEY CIVILIZATION

Dr. Reza Mostafavi Sebezavari,

The Loghat nama Dehkhoda which is the greatest dictionary of Persian Language and of course by virtue of authentic references it should be considered as an Encyclopedia of Persian language, says about the past of Sindh:

"It is the name of a famous and renowned land and cities like Kanoj, Lahore are situated in it and it is located between India, Sestan and Kerman".

At least this brief introduction of Sindh manifests the magnanimity And vastness of Sindh from Iranian mind and expression so that firstly they Considered that place was famous and renowned and Secondly treated It 's location being all the area between India and Iran.

Similarly, the we know geography book "Himmat-e-Aqleem" writes about the Sacredness and Sanctity of that place "In that (Sind), there is desert where in there is a house named as Bait ul Zahab (Golden House) and snow does not fall up to 28 miles around that house whereas it falls over all the places of this desert. And this desert is known as Zoroastrian desert and Manus still honour that place."

This definition Of Sindh, which has of Course been copied by the It is interesting to note that Shungol and his renowned Companions Including the king of Sindh were the guest of Behram, the Sassanid King for two month there after he waived off the tribute of his country.

The above mentioned authentic proofs reflects that Iran close relations with Sindh. No Doubt the said relations, that too on head of the State level, between Iran and Sindh helped in creating good will between them, and Iran's Contribution in this avenue regarding transferring her Culture and Civilization towards Sindh becomes Completely evident.

On the basis of authentic Iranian sources BuzurgMeher the intelligent minister of Naosherwan devised the backgammon board game and then it was presented to the Roy of India along with a letter. Book of Anad Raj Loghat Nama Persian to Persian (dictionary) compiled in India, shows how sacred has the Sind area been to the Iranians from ancient times and they have been respecting it.

Similarly, historians believe that trade and cultural relations between people of shoosh (southern Iran) and the Indus valley have been maintained from ancient days because the archeological effects recovered from the ruins of Mohenjodaro, Taxila, and Harapa have

Slave of God, Mehood, or for example another epitaph of Ameer shams Uddin Makai of Thatta who was know as "Rustum Dastan."

Some times these epitaphs Simultaneously moving the Pakistan's nation happen to be the Catalysts and inculcators of the rich Islamic Culture and ordering the righteousness. Some valuable recourse like " Sanadid e Sindh " complied by Prof. Dr. Maulavi Mohammad Shafi and also Miras -e -jawidan (The Eternal Heritage) by Dr.Kamal Haj. Syed Jawadi is considered to be one of the authoritative evidences regarding lot many letters and verses. And the Collection of these epitaphs in Persian Language all over Sindh is taken to be one of he reflections and manifestations of Persian Language and Iran Cultural role in the formation and shaping of Sindh Culture and Civilization.

BORNZE AGE CULTURE IN THE UPPER INDUS VALLEY

Muhammad Arif

The pre-historic culture of Northern Areas however, is related to those of Southern Siberia where Okunev culture was dominant. The mascoid, a characteristic motif of the Okunev culture, began in the third millennium BC, borne by wandering cattle breeders and in the course of several centuries, had undergone a marked expansion and various changes. It seems probable that the Okunev people advanced to south as other elements in their stock of symbols turn up on rocks in the Indus Valley.

Rock carvings in the Lang Shang area (Maringer 1950) situated almost 1700 kms. to the SSE (of the Altai) belong to "Okunoid" tradition as well. Dani quite correctly observed the great variety of archaic petroglyphs in respect to content and style. He offered, however, an explanation by the hypothesis that hunters and later on herdsman of Mesolithic tradition, who lived in almost inaccessible home land, got the chance to develop several regional and individual styles of rock art, which is very expressive and for us surprising and has hardly any parallel, elsewhere. Only later on this splendid isolation was broken and then we meet with the spectrum of scripts and iconography's known from other parts of Asia.

During the Bronze Age, in third and second millennia, Northern Areas of Pakistan are therefore like Ladakh and Zaskar fully related or at least connected to the cultures of the steppic Bronze Age. Rock carvings with extremely strong patination and styles were discovered at Thor North site, which were different from the Buddhist material. The most interesting concentration just opposite Chilas was called Ziarat after a single tomb enclosure of a Muslim shaheed. In some drawings we see clearly the characteristics of what was called bi-triangular style. This means that the body of the animal figures is considerably narrower in the middle. Some times we get the impression that it is composed of two triangles joined together at a corner.

Like Kashmir and Swat most of the pre-historic rock carvings should be assigned to the second millennium BC. This is possible with the dating of one petroglyph, which can be put into a more general context, namely Chariot and an Anchor discovered At Thor North site. The type of the chariot indicates a date on the turn from the second and the first millennium BC (Jettmar's report "Rock art in Northern Pakistan between 1979-1989 unpublished). One typological group consists of carts with small disc wheels. Two different animals, for instance, ox and goat, draw them. This is evidently not realistic but is the expression of some religious idea (Ser 1980: 194-205). The other typological group consists of Chariots with spokes-wheels, drawn almost exclusively by horses. This type is considered as younger as compared to first millennium BC. At the sites of Thalpan Ziarat

and Thor North only animal drawings in bi-triangular style along with human figures in the same stylization, rendered in simple lines are discovered.

However, there are other humans depicted on a scale much larger than that of the animals. At Thalpan Ziarat drawing is of man-size. Amidst the other picture it looks like a giant. He is presented only in outline with his feet straddled and his arms stretched to the sides. The top of his head is surrounded by sunrays, (may be) indicating hair. A similar large figure is also seen near the mouth of the Minar Gah. Such pictures have a faint similarity to carvings on Menhirs in Southern Siberia and attributed to the Okunev Uls culture. The carvings in the Indus valley near Chilas may belong to the same time as Okunev Uls, namely relative to Bronze Age. This may indicate the main direction of cultural affinities relevant to Bronze age. This may indicate the main direction of cultural affinities relevant to Bronze Age men, living in the areas that are now called Northern Pakistan. They had close contact with Iran, Central Asia, China and Kashmir (Ser 1980: 210).

Prof. KARL Jettmar described some bronze/copper axes, spoons, forks and rods from the villages of Manikyal and Gumari in darel valley – from the vicinity of the same site where graves have been earlier located. Dr. Mughal former Director General of archaeology and Museums dates them to the last quarter of the second millennium BC. "The trunnion axes are linked typologically with those known from the Mediterranean region, Europe, Trans-Caucasian and Northern Iran. Prof. Karel Jettmar further observes that the occurrence of trunnion axes of western type in Northern Pakistan indicates penetration of Caucasian elements into the steppes and eastwards in the Pamir and then into the Hindukush and the Karakorum".

In Yasin just by the Razbarnala, at the place of Fiti Das, there is a boulder with a faint engraving, most probably dated prior to second millennium BC is discovered. At the entrance of Yasin valley not more than four km from the Suspension Bridge near the mouth of the Yasin river pre-historic rock carvings were found, which shows both animal and human figures. The sites are not far from Pamir; apparently, there should be cultural link with Trans-Pamir engravings. On the other hand within Shangrilla hotel at Skardu, Baltistan, there are some tall standing boulders having pre-historic engravings of men and animals – all the figures are drawn in outline. Workman ship is primitive but there is nothing in the drawing to specify a definite date. However, stylistically they can be dated between 2000 – 1000 BC. In Gupis valley also pre-historic drawings of this period were found at several sites. At the sites of Matujlasht, Rahimabad Das, Thurjal, and Payukush, drawings of ibexes, markhors, hunting scenes, human figures and horse riders are found in rock carvings.

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